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*The Balance of Nature and Modern
Conditions of Cultivation*

George Abbey

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THE BALANCE OF NATURE

AND MODERN CONDITIONS OF CULTIVATION

A Practical Manual of
ANIMAL FOES AND FRIENDS
for the Country Gentleman, the Farmer, the
Forester, the Gardener, and the Sportsman

By
GEORGE ABBEY

With 150 Diagrammatical Drawings



LONDON
GEORGE ROUTLEDGE & SONS, LIMITED
NEW YORK: E. P. DUTTON & CO.

1909

TO VIND
ABSORBILAO

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PREFACE

THE Small Holdings and Allotments Act, 1907, practically the first recognition by the legislature of the national right to use of the land for the benefit of the whole community, appears opportune for referring to the natural and nurtured creatures, called *wild*, that roam over the British Islands, and concomitantly with mankind and domesticated animals derive their subsistence directly or indirectly from the products of the soil. Some of these, by their habits and nature of food, make for (called *beneficial*)—others exert no decisive influence on (termed *neutral*), and others again militate against (called *hurtful*)—the successful cultivation of crops, as represented in yields of animal and vegetable produce, upon which depend the stamina and life of the nation.

The object, therefore, of the present volume is to treat of the chief wild and semi-wild vertebrates—mammals, aves or birds, reptiles and amphibians—found in the British Islands in relation to the cultivation of crops, and in accordance with observation and experience from 1845 to 1907 inclusive. These embrace the garden, allotment, small holding, farm, and estate—its woods, commons, moors, mountainous tracts, and the waters of all to the foreshore of the sea. The cultures adopted are gardening, farming, foresting, sporting, and fishing. The practice of these pursuits is vested in the owner or occupier of the land, while the “lord of the manor” exercises certain rights, not only over the territory occupied by himself, or granted to tenants for stipulated rents or services,

but over those portions of the estate known as common or waste, in some instances held conjointly, in respect of certain privileges, with freeholders and copyholders or their tenants, and in other cases vested entirely in the "lord of the manor."

Since the reign of Edward III (1327-1377) no manors, with all their incidents and franchises, have been granted in England. Land acquirement at that period for purposes of cultivation was unquestionably acute and resulted in the Peasants' Revolt (1381); and it was not till the time of Elizabeth and onward to Anne that relaxation was shown by lords of manors in keeping the peasants from working on the land to their own benefit, while they and freeholders lost no opportunity of inclosing waste land adjacent to and corresponding with the respective frontages. Thus the greens, commons, and lanes were much restricted by the land hunger of the privileged classes, and this condition of things continued more or less till legislative enactments intervened.

On the land enclosed from waste, many, if not most, of the cottages with their gardens and adjacent crofts or small fields were founded, and became by the time of George III—Farmer George—a feature of rural Britain. The landowners at the latter part of the eighteenth and beginning of the nineteenth century had, judging from the age of the standard fruit trees in the gardens and orchards in 1845, granted holdings of land on their estates proportionate to the requirements of the progressive labourers and other persons with agri-horticultural proclivities on which to employ their spare or whole time advantageously to themselves, while the landlord's interest was protected in respect of rent and influence.

At that date (1845) the sporting interest was limited to nature-produced game on many, if not most, estates, and the cultivators of the soil had practically a free hand in dealing

with the enemies of crops other than those reserved by the landlords, which were protected against unlawful decimation by the Game Laws. There was no Wild Birds' Protection Act to prevent the schoolboy bird's nesting to his heart's content, the overseers of parishes paying premiums on house sparrows' eggs, young, and adults, and birdcatchers plying their avocation mainly through inciting town residents to keep in captivity the wild birds of the country and even some of its animals, such as the squirrel and dormouse. All the votaries of the cultures—sporting, fishing, foresting, farming, and gardening—vied with each other in destroying the enemies of their crops, and carried this to such extent that the "lover of nature" raised a hue and cry against the depletion of the wildings as being inconsistent with the interests of the nation and even of the cultures, inasmuch as no distinction was made between friends and foes, while apart from these considerations the rarer resident and migratory subjects were threatened with extinction.

The outcome of "lover of nature" agitation was the passing of the Wild Birds' Protection Acts, 1869 (32 and 33 Vict. cap. XVII), 1872 (35 and 36 Vict. cap. LXXVIII), and 1876, the latter having regard chiefly to birds forming important articles of food and commerce, while the two former embraced British birds under purely local names, others under different names for the same birds as if they belonged to different birds, while there are also omissions implying compilation by persons not well acquainted with the subjects. These matters, however, were subsequently amended, and power was given to County Councils for modification of such measures as related to their respective counties or districts.

The "lover of nature" efforts in protecting the wild birds had their reflex in an inordinate increase of game, and this so pressed on the arbori-agri-horticulture industries that legis-

lators put down ground game by passing the Ground Game Act in 1880, and this so worked that the Hares Preservation Act was passed in 1892 in order to protect the hare from extermination. Meanwhile, and after these repressive and protective measures, winged game was multiplied; and it so prejudiced the agricultural interest that, in 1906, the legislature made provision in the Agriculture Holdings Act for compensation to tenants in respect of damage to crops by winged game, particularly hand-reared pheasants.

The Wild Birds' Protection Acts and the Game Laws referred to, together with the enforced attendance of children at school till the age of fourteen, have had their effect on the increase of small birds, particularly the *beneficial*; the *neutral*, or frugiverous and grain-eating, multiplying inordinately, and the *hurtful*, or rapacious, decreasing to the advantage of sporting and fishing, while prejudicing the foresting, farming (excepting poultry and pigeons) and gardening interests.

On these matters of vital importance to the success of the several cultures and the profit in full measure to the nation, my observations and experiences of the wild and semi-wild land vertebrates as *aids* and *hindrances* in those respects have particular reference. And these observations and experiences being in accord with the voluntarily expressed statements of careful and experienced observers responsible for their several respective charges, the deductions drawn from them may be relied upon as consistent with the several interests involved, in all of which success depends, other conditions being favourable, upon conservation of the *Aids* and limitation of the *Hindrances* so far as compatible with the national welfare.

The *aids* imply several protective means, and the *hindrances* various repressive measures, being adopted as befits the subjects of culture. In this connexion careful note has been made of the means and measures seen in practice, or vouched for

by experienced practitioners ; therefore the work, in this respect, is more or less a compilation—a feature which, in treating of many subjects and divers interests, can hardly be avoided. The endeavour, however, has been to keep as far from reference to authors of works on Natural History as justifiable ; indeed the only book at command for many years was Wood's *Illustrated Natural History*, second edition, 1854, which, with *The Popular Encyclopædia*, new edition, 1879, Blackie & Son, London, and *Farm Vermin*, Rider & Son, London, represent the measure of indebtedness. Excerpts from various periodicals and treatises relative to the subjects treated are acknowledged in the text, where reference is duly made to inventors and manufacturers of appliances intended respectively for protective and repressive measures.

And now the volume of *The Balance of Nature and Modern Conditions of Cultivation* is committed to the careful scrutiny of my fellow-countrymen, in the firm conviction of their verdict being unanimous for the land and water of the British Islands being devoted to all the cultures named herein, and regulated in such manner as may be most conducive to the benefit of the whole community of mankind.

G.A.

INTRODUCTION

THE total area (including water) of the United Kingdom is 77,498,955 acres. Over, on or in, this extent of land and water are found the wild or semi-wild mammals, birds, reptiles, and amphibians embraced in the following pages. These denizens of the cliffs, marshes, rivers, brooks, and lakes, wastes, mountain and heath, land under crops and grass, woods and plantations, orchards and gardens, exercise *beneficial*, *neutral* and *harmful* influence, according to their respective proclivities, upon the culture and produce of crops. The cultures practised are five, viz. sporting, fishing, forestry, farming and gardening.

SPORTING, we may assume, was primarily originated by man to procure animal produce such as deer, wild boar and hare, among mammals; and among birds, the bustard, cock-of-the-wood, black-cock, grouse, partridge, pigeon, geese and ducks, thus representing *ground* and *winged* game pursued for diversion and food. The pursuit of these nature-provided food creatures was, however, interfered with by wolves, foxes, and other flesh-eating and blood-sucking animals, also by eagles, hawks, and other birds of prey. These, therefore, as militating against the presence of the animals and birds desirable as affording pastime and food were hunted, trapped, captured and destroyed as *vermin*. Thus, we arrive at the definitions: *game*—wild animals good for food, called *ground*, and wild birds of edible quality, termed *winged*; *vermin*—wild animals of carnivorous habits, called *ground*, and wild birds of a rapacious nature, termed *winged*.

In sporting, the dog appears the first *aid* employed by the sportsman in the capture of the food-supplying animals, and also in the decimation of the beasts of prey. Of the former description were and still are the deer-hound, boar-hound, hare-hound or harrier, and greyhound. Of the latter were the wolf-hound, the wolf not being finally extirpated in England till 1350, in Scotland till 1600, and in Ireland till the beginning of 1700, the fox-hound and otter-hound, both still in vogue, with the terrier, for the purposes of sporting and destruction of vermin.

The horse also was requisitioned at an early date to enable the hunter to follow hounds and be up at the capture or kill of the

quarry, all-important when the object was *game*, and hardly less essential when the purpose was securing some relic of the *vermin* in order to obtain the reward—premiums being placed on the heads of wolves and tails of foxes.

Up to the time of William the Conqueror all classes of the community appear to have vied with each other in chasing and killing wild food-supplying animals and birds as distinguished from the domesticated, and this not only on cultivated land but in the forest, which had become so much encroached upon and brought into cultivation as to interfere with the chase. From that time dates the distinction between the qualified and unqualified sportsman, the former retaining hold on the wild food-supplying denizens of the British Islands by Forest Laws passing into Game Laws and Wild Birds' Protection Acts ; and the latter in all time up to the present evading and breaking legislative enactments from a sense of right inherent in Anglo-Saxon blood to partake of the advantages bestowed by nature. The first implies the culture called *sporting*, and the latter the non-cultivation, termed *poaching*.

By the Forest Laws and Game Laws two kinds of sporting were made feasible, viz. stag-hunting, hare-hunting, greyhound coursing, and falconry—all diverting and food-supplying pastimes ; fox-hunting, otter-hunting, and other exploits by canine or engine-means in capturing and destroying vermin. The inference from these two opposites is that of sporting being ingrained in man, and as keenly appealing to one class of persons as to another without regard to sentimentalism. *Game*, therefore, must be protected and preserved, while *vermin* is also tolerated in co-relative degree, otherwise the life is taken out of sporting, and a national feature defunct.

FISHING, like sporting, was no doubt first had recourse to as a food-supplying diversion, the exercise of brain and muscle being mind-invigorating as well as the catch body-sustaining. The angler, anxious to secure trout or salmon, loses no opportunity of trawling for pike, while the fisherman spares not the water and land vertebrates that prejudice the success of his nets, well-baited hooks, and traps. There are two sides to the fishing culture, viz. the food product, and the militating against that produce by depredatious creatures of water and of land. The water-ponds and lakes, brooks and rivers, extend over 2,974,739 acres of the United Kingdom area, and are all more or less replete with finny denizens providing diversion to leisured persons ; affording relaxation and exercise of skill, patience, and effort to individuals engaged in industrial pursuits, with relatively little spare time, and no little amusement, with some profit of mind and body to the rising generation.

The fisheries, or rather the fish in the water, interfere with no land culture, but certain members of the *ground* and *winged* land

or semi-land vertebrates make inroad on the fish, against which it is necessary to take repressive measures as, in this connexion, *vermin*. And, as in sporting, there are *qualified* and *unqualified* fishers. The right to fish and fishing was originally vested in the crown, and the privilege to fish up to the time of Henry II was by royal franchise. But, by Magna Charta, the crown was deprived of the right of conferring such franchises in future, although it continued all such as had not been conferred subsequently to the date mentioned. When a person's land adjoins a stream where there is no ebb and flow, that person is assumed to have an exclusive right to fish in the stream as far as his land extends, and up to the middle of the stream. When a person's property adjoins both banks of a stream, that person is of course assumed to have the exclusive right of fishing in the whole breadth of the stream. So also when a person's land encloses a pond, the fish in that pond belong to him. When several properties are contiguous to the same lake, the right of fishing in that lake is vested in the proprietors, and the public have no right to fish in such lake even when it is bordered at some part by a public road. The right to fish, therefore, is vested in the landed proprietors with reference to the waters which are enclosed in, which run through, or are contiguous to their lands.

The fisheries, as regards the Salmon and Freshwater Fisheries Acts administration, are in the hands of local boards of conservators appointed for the purpose, with the Board of Agriculture and Fisheries as the central authority. Districts may be formed, and Boards of Conservators appointed for waters containing salmon, or freshwater fish. These Boards have power to make bye-laws, not only for the regulation of the fisheries for salmon and freshwater fish, but also in certain cases for the regulation of other kinds of fishing which are prejudicial to such fisheries. They are also empowered to issue licences for fishing for salmon, trout, etc., and make regulations in respect of close time for freshwater fish.

Fisheries, especially inland fisheries in lakes and rivers, are thus protected and encouraged in various ways by laws applicable to the several districts, and infringement of the regulations punishable by fine or imprisonment, unqualified fishers—the unlicensed *poachers*, being amenable to the Fishery Laws. Fishing, therefore, is protected against unright entering on another's fishery without leave and dependent for continuance upon conservation and culture, safeguarding against undue depletion by either its votaries, or that of *vermin*, whether *ground* or *winged*.

FORESTRY. The total area of woods and plantations in the United Kingdom is 3,069,375 acres, the trees, undergrowth and open spaces of which afford shelter and (to some extent) food for many wild and semi-wild land vertebrates, timber for fencing, structures, implements, and other requirements of civilized life.

"In the times of the Britons the whole of Great Britain was replenished with all sorts of game, and the Britons, who lived in a wild and pastoral manner without enclosing or improving their grounds, derived much of their subsistence from the chase, which they all enjoyed in common. But when husbandry took place under the Saxon government and lands began to be cultivated, improved, and enclosed, the beasts naturally fled into the woody and desert tracts, which were called *forests*, and not having been disposed of in the first distribution of lands, were therefore held to belong to the crown. These were filled with great plenty of game, which our royal sportsmen reserved for their own diversion on pain of a pecuniary forfeiture on the part of such as interfered with their sovereign. But every freeman had the full liberty of sporting upon his own territories, provided he abstained from the king's forests. However, upon the Norman conquest, a new doctrine took place, and the right of pursuing and taking all beasts of chase or venery, and such other animals as were accounted game, was held to belong to the king, or to such only as were authorized under him. The right thus newly vested in the crown was exerted with the utmost rigour at and after the time of the Norman establishment, not only in the ancient forests, but in the new ones which the Conqueror made by laying together vast tracks of country depopulated for that purpose, and reserved solely for the king's royal diversion, in which were exercised the most horrid tyrannies and oppressions, under the colour of forest law, for the sake of preserving the beasts of chase, to kill any of which, within the limits of the forest, was as penal as the death of a man. And in pursuance of the same principle, King John laid a total interdict upon the *winged* as well as the four-footed creation, '*capturam avium per totam Angliam interdixit.*' The cruel and insupportable hardships which these forest laws created to the subject occasioned our ancestors to be as zealous for their reformation as for the relaxation of the feudal rigours and other exactions introduced by the Norman dynasty, and accordingly we find the immunities of *carte de forests* as warmly contended for and extorted from the King with as much difficulty as those of *Magna Charta* itself. By this charter, confirmed in Parliament, many forests were disafforested or stripped of their oppressive privileges and regulations were made in the regimen of such as remained—particularly, killing the king's deer was made no longer a capital offence, but only punished by a fine, imprisonment, or abjuration of the realm. And by a variety of subsequent statutes, together with the long acquiescence of the crown without exercising the forest laws, this prerogative is now become no longer a grievance to the subject" (Blackstone, *Commentaries* vol. ii. p. 415).

The great importance of wood to society, and the rapid decrease of forests in populous countries, if particular care is not taken of them,

have led, in modern times, to a careful investigation of the subject of the management of forests and everything connected with it. The Germans were the first who treated scientifically of the management of forests, and established forest academies, in which all branches of the knowledge relating to them are taught. France has likewise paid attention to her forests, and has enacted a *code forestier*. And now that our own Government has taken afforestation in hand by purchasing the estate of Inverliever, in Argyllshire, owned by Colonel Malcolm, of Portalloch, consisting of about 12,530 acres, the price agreed upon being less than £30,000, and on which it is intended to found a State forest demonstration, there is a prospect of some of the 15,000,000 acres of mountain and heath land, with possibly a portion of nearly 10,000,000 acres of other lands, being reclaimed, and thus yield some, if not all, of the £30,000,000 worth of timber imported into this country annually, and also the 3,000,000 acres of woodlands in the United Kingdom, quite as much devoted to game, sheltering and beautifying the earth's surface, as to the production of timber, be so improved by judicious forestry as to contribute more than the £3,000,000 worth of timber annually, as at present, to the nation's requirements, while at the same time developing certain rural industries. In England and Wales there are thirty-four local authorities with catchment areas owned or leased of 90,000 acres, and of these only 2,000 acres are in woodland. In these catchment areas there is, no doubt, as in the case of mountain and heath and also other lands, much ground not suitable for afforestation on account of soil unfitness, altitude and exposure of location, and to these considerations has to be given due weight in regard of profitable development. This is one of the chief difficulties in the way of large schemes of afforestation in this country, and above all the divided ownership of large tracts of contiguous land essentially desirable for afforestation. Add to these difficulties that of from 30,000 to 40,000 acres of land annually snatched from the agricultural domain of the United Kingdom for residential, factory and industrial purposes, the burden under which municipalities and private owners and through them the State labour in the matter of afforestation as compared with other countries, is made more apparent, particularly as not only the woodlands, mountain and heath, and other lands, are held quite as much, if not more, as sporting grounds as for timber and light grazing purposes. Deer forests and lands exclusively devoted to sport in countries other than crofting counties in Scotland, represent a total of 557,544 acres, with a rental, as shown in the valuation roll, of £36,118. Surely, this area, and at least ten, if not twenty, times its multiple of mountain and heath, or other lands, could be reclaimed by municipalities and the State, who in former times have allowed large forests and large tracts of land to slip away either from ownership or

control, for afforestation upon terms more advantageous to the present proprietors pecuniarily, and as a municipal and national duty to certain classes of labour as an immediate and practicable source of employment as well as in the near future development of national wealth, whether as rural industries, or water, or even aesthetic reasons, combined with timber production.

Forestry, however, may only be successfully practised where the conditions are reciprocal as between sporting and even fishing. Game, *ground* and *winged*, affording sport and food, and also vermin, *ground* and *winged*, affording sport in pursuing or capturing without value other than skins, furs, or feathers, must not be unduly numerous on the one hand, or tolerated on the other hand so as to prejudice the growth of the trees.

FARMING, or the art of cultivating the soil in such a manner as to cause it to produce, in the open field, crops of such plants as are useful to man and to the domesticated animals, and including the breeding and rearing of these animals, is the basis of all other arts, and in all countries coeval with the dawn of civilization. It is the most universal and the most ancient of the arts, and employs a large part of the population of almost every civilized community. The Egyptians, Chaldeans and Chinese held it in high estimation, also the Japanese and Phœnicians. The ancient Greeks practised farming, and Hesiod, supposed to have lived about 735 B.C., wrote a poem on agriculture, entitled "Works and Days." The Carthaginians carried the art of agriculture to a higher degree than other nations, their contemporaries. Mago, one of their famous generals, wrote no less than twenty-eight books on agricultural topics, which, according to Columella, were translated into Latin by an express decree of the Roman Senate.

The ancient Romans venerated the plough, and in the earliest and purest times of the republic, the greatest praise was given to an industrious husbandman, whose farm management was in general based upon thorough tillage, judicious manuring, rotation of crops, attention to cultural details, adaptation to soil and circumstances, conservation of natural aids and decimation of enemies.

When the conquering arms of Rome reached the British Islands they found the barbarous inhabitants existing chiefly upon the produce of their herds and of the chase, the inland inhabitants, descended from the Cimbri, lived in straw-thatched cottages, and knew nothing of husbandry—they tilled no ground and sowed no corn, but subsisted for the most part on milk and flesh. But those who dwelt near the coast, and particularly on that part of it now known as Kent, Essex, Suffolk and Norfolk, were acquainted with the treasures of the soil. Tacitus, referring to this part of Great Britain, says: "The soil is such that, except the olive and the vine, and other vegetables usually raised in hotter climes, it really

bears all fruit and grain, and is very fertile. Vegetation there is rapid, but ripening is slow, and for both these effects there is the same cause—the excessive humidity of the soil and air” (*Vita Agric.* c. xiv.).

Although Britain was first visited by the Romans fifty-five years before the Christian era, it was not till the time of Agricola, A.D. 78, that the attention of the natives was successfully directed to cultivating the soil and the improvement resulting in the exportation of large quantities of corn annually, which, during the government of Agricola, augmented the tribute which had formerly been imposed upon grain.

The Angles and Saxons, immediately after the departure of the Romans, about A.D. 450, formed a settlement in our island, and during the time they were extending their conquests over the country, agriculture must have been greatly neglected, but afterwards when Egbert, about A.D. 726, was generally hailed by the inhabitants (no doubt tired of the civil wars and hindrances to the practice of the useful arts) sole sovereign of the realm, it was practised with some success among the Anglo-Saxon population, especially, as was generally the case during the Middle Ages, on lands belonging to the Church. Swine, at this time, formed a most important portion of the live stock, finding plenty of oak and beechmast to eat. The raising of cattle and sheep, and agriculture generally, was the chief occupation. Large tracts of the marshy land in the east of England were embanked and drained and brought into cultivation. The forests were extensive, and valuable both from the mast they produced for the swine and from the beasts of the chase which they harboured. Hunting was a favourite recreation among the higher ranks, both lay and clerical. Fishing was largely carried on, herring and salmon being the principal fish caught. The houses were rude, ill-built structures, but were often richly furnished and hung with fine tapestry. The dress of the people was loose and flowing, composed chiefly of linen, and often adorned with embroidery. The men looked upon the hair as one of the chief ornaments, and wore it long and flowing over their shoulders. Both sexes were fond of wearing gold and silver ornaments; and were notorious for their fondness for eating and drinking excessively. Pork was a favourite article of food, and so were eels, which were kept and fattened in eel-ponds and sometimes paid as rent. Ale, mead, and cider were the common beverages, wine being limited to the higher classes.

The whole Anglo-Saxon community consisted of the *corls* and *ceorls*, or the nobles and common freemen. The former were the men of property and position, and were themselves divided into ranks; the latter were the small landholders, handicraftsmen, etc., who generally placed themselves under the protection of some nobleman, who was hence termed their *hlaford* or lord. Besides these

there was the class of the serfs or slaves (*theowas*), who might be either born slaves or freemen who had forfeited their liberty by their crimes, or whom poverty or the fortune of war had brought into this position. They served as agricultural labourers on their masters' estates, and though they were mere chattels, as absolutely the property of their master as his cattle, their lot does not appear to have been very uncomfortable. They were frequently manumitted by the will of their master at his death, and were also allowed to accumulate savings of their own, so as to be able to purchase their freedom or that of their children.

Norman rule was marked by the introduction of the continental feudal system into England and caused a complete change in the mode of tenure of land. From Domesday Book, compiled by order of William the Conqueror, we learn that the whole territory of the kingdom was divided into 60,215 fiefs, the half which were granted to civil superiors, while the other half were reserved for the Crown and the Church. These estates, along with all the buildings erected upon them, all the revenues to be derived from them and with a population corresponding to the size of the estate, either totally enslaved or only partially free, pledged to the payment of certain sums for protection, or in the way of taxes, and to the performance of certain services for their masters, were granted under the condition that they should return to the crown or the liege lord of the feudal tenant on the death of the latter without any heirs enjoying the right of feudal succession (*escheat*), or in case he were guilty of felony (*forfeiture*). About 1,400 of the largest fiefs were granted to *Crown vassals*, and as the possessions of these "great barons," as they were called, were often very large, it became a common practice both among secular and ecclesiastical tenants to subdivide their fiefs into smaller ones. All the three grades of vassals, the great barons, the small barons, and the vassals of the great barons, were bound together by the common obligation of military service to the Crown. This last grade consisted chiefly of proprietors of middle rank, who formed the gentry or inferior thanes among the Anglo-Saxons. The greater thanes had mostly been expelled from their holdings by the Norman invaders. In addition to these three classes, the Domesday Book also makes mention of two other classes liable to military service, the freemen (*liberi*), and the sokemans (*district liberi*), men enjoying freedom in a given soke (district), but out of it slaves, the former of whom amounted to about 12,000 and the latter to 23,072. The "freemen" were for the most part composed of the old "ceorls," or free peasant proprietors, who at one time formed the main strength of the Anglo-Saxon population. Although called free they were not really so, and still less entitled to that name were the sokemans, as upon both classes it was imperative that they should perform certain services to the lords of the land, in which

their possessions lay, only their estates were capable of being inherited by their sons of full age. The remainder of the ceorls had sunk to the condition of bondsmen, whom the Normans designated by the appellation of "villeins." They were a poor, oppressed class, and can scarcely be considered as having been better than the slaves, who are also mentioned in the Domesday Book.

The feudal system introduced by the Normans, though beneficial in some respects as tending to ensure the personal security of individuals, operated powerfully against progress in agricultural improvements. War and the chase, the two ancient and deadliest foes of husbandry, formed the most prominent occupations of the Norman princes and nobles. Thriving villages and smiling fields were converted into deer forests, vexatious imposts were laid on the farmers, and the serfs had no interest in the cultivation of the soil. This may be inferred from the fact that as late as the close of the thirteenth century the highest rent was sevenpence an acre, while some land was let at as low as a penny per acre. Obviously the forest laws and the restrictions on the killing of the depredators of crops so militated against agricultural pursuits that it was scarcely worth striving to cultivate the ground, inasmuch as this were more to the benefit of the chase than the farmer.

But agriculture found encouragement among the ecclesiastics, mainly because their lands were *free* for cultivation as they considered best calculated to augment their resources, and also that they might derive most benefit from the *tithe* (Anglo-Saxon, *theotha*, "a tenth part"), which is first mentioned in any written English law in 786, a synod in that year enjoining the payment of tithes, hence we may conclude not before compulsory. In 794, Offa, king of Mercia, made a law whereby he gave the tithes of all his kingdom to the Church, a law which was made general for all England by Ethelwulf, and about 1200 A.D. the tithes of each parish were allotted to its own particular minister by the written law of the land.

The chief feature of Magna Charta as regards agriculture was that many parts of the charter were pointed against the abuses of the power of the king as lord paramount, the tyrannical exercise of the provisions of the forest laws was checked, and many grievances incidental to feudal tenures were mitigated. MAGNA CHARTA LIBERATUM, the Great Charter of Liberties, was extorted from King John by the confederated barons in 1215. A second confirmation of Magna Charta was granted by King Henry III, the benefits of the charter being extended to Ireland. The Charter of Forests, the ninth Act of Henry III, was the first statute by which the forest law was explicitly determined. By this instrument, which materially contributed to the comfort and prosperity of the nation, all the forests which had been enclosed since the reign of Henry II were thrown open, offences in the forest were declared to be no longer capital, and men convicted of the once

heinous crime of killing the king's venison were made punishable only by fine or imprisonment. Thus the nobles, ecclesiastics, yeomanry and free peasantry were granted full liberty of sporting upon their own territories, provided they abstained from the king's forests. This applied to the *winged*, interdicted by King John, as well as the four-footed creation, and implied lands enclosed, improved and cultivated, while the ruminant and rodent animals, other than domesticated flocks and herds, naturally fled into woody and desert tracks, which were called forests.

Town Charters granted under the reign of Henry II, 1154-89, which freed the towns from the direct influence of the barons, conferred no Parliamentary privileges until Magna Charta, 1215, which compelled the king to obtain the consent of the enfranchised classes before levying taxes, and the extension of the Parliament to include the Commons, or burgesses (voters in corporation towns), in the first House of Commons in 1265. The lowest form of franchise, however, was that of the members of close corporations or burgesses of towns, so that the great mass of the people were practically serfs, without political or legal rights, whose duty it was to render certain services to the lord of the manor in return for the privilege of obtaining their own living from the land which they were not allowed to leave. But as the towns grew up and industry developed, merchants and artisans began to organise themselves into guilds, practically "trade unions," in order to further the particular interest involved, and because the feudal system was found too local in character and unfitted for the expansion of the national life—the growth of prosperity amongst the people from both manufacture and agriculture. The richer tenants, feeling the feudal obligation to render services in labour to their lords was unbearable, began to commute them for money payments, which they found more economical, and the poorer began to earn their living by hiring themselves out as wage-paid labourers to others, besides working on their own land.

The GREAT PLAGUE, called on account of its terrible effects the "Black Death," in 1348, destroyed nearly half of the population, and there was a sudden and complete disorganisation of industrial life. Labourers, because of scarcity, could command high wages, and tenants obtain low rents from landlords, who were anxious to let their land and who were compelled to remit the traditional services. Albeit, King and Parliament strove to make the labourers take the same wages as before the Plague, enacting dire penalties in the Statute of Labourers, 1350, and the landowners did their best to tie down the labourers to the soil. Free labourers and tenants who had commuted their services for money payments, were attacked, lawyers employed as stewards on manors, and their ingenuity exercised in trying to restore the landowners' right to customary labour, while former exemptions

and manumissions were often cancelled, and labour service again demanded from the villeins or freemen.

The STATUTE OF LABOURERS led to a gradual union of labourers and tenants of all classes against the landowners. There came a visitation of the plague in 1361, and also in July and September, 1369, each of which rendered labour scarcer and labourers more bold in their demands. These were met by repressive measures of Parliament and landowners, which in turn gave inducement to combinations of workmen in towns, and to gatherings of villeins and fugitive serfs in the country districts, where the manorial lords, in difficulties, were pressing the villeins to render actual service.

The outcome of the conflict between the combinations and confederacies of labourers sympathised with by John Wycliffe and his disciples—the “poor priests,” as distinguished from the beneficed and landed, and the repressive and coercive measures of Parliament and the manorial lords, was the PEASANTS’ REVOLT, though the proximate cause was the poll-tax, which, levied at first with mildness, but farmed out to courtiers, was exacted with great severity, the recusants being handled very severely and uncourteously, “almost not to be spoken.”

On the morning of June 14, 1381, a proclamation was issued to a multitude that crowded Tower Hill, and they were told that if they would retire quietly to Mile End the king would meet them there. King Richard III was surrounded by upwards of sixty thousand peasants, mild and respectful in demeanour, and they presented no more than four demands: (1) the total abolition of slavery for themselves and their children for ever; (2) the reduction of the rent of good land to fourpence the acre; (3) the full liberty of buying and selling, like other men, in all fairs and markets; (4) a general pardon for all past offences. The king, with a gracious countenance, assured them that all these demands were granted, and in returning to town he employed upwards of thirty clerks to make copies of the charter containing the four clauses. In the morning these copies were sealed and delivered, and then an immense body of the insurgents, consisting chiefly of the men of Essex and Hertfordshire, quietly withdrew from the capital, but the more dangerous men remained behind.

Wat Tyler and the leaders with him rejected the charter which the men of Essex had so gladly accepted. Another charter was drawn up, but it failed to please, and even a third, with still larger concessions, was rejected with contempt. The next morning the king went to Westminster, where he heard Mass, afterwards mounting his horse, and with a retinue of barons and knights rode along the “causeway” towards London. On coming into West Smithfield he met with Wat Tyler. In the front of the Abbey of St. Bartholomew Richard drew rein, and said he would not go thence

until he had appeased the rioters. The meeting resulted in the death of Wat Tyler, and in Richard, soon after, finding himself at the head of 40,000 horse, telling the people that all the charters meant nothing, and that they must return to their old bondage. Then courts of commission were opened in different towns to condemn rather than to try the chief offenders. Jack Straw, the "riotous priest" of Essex and one of Tyler's chief lieutenants, whose intention was to get rid of the magnates and create local communes, was executed. John Ball, the "wicked priest" of Kent, chaplain of Tyler's host, and first great propagandist for the equality of all men, abolition of the whole system of Society, based on class and social distinctions and individual ownership of land and wealth which is socially produced, now called "Socialism," was captured at Coventry, tried at St. Albans on July 13, hanged in that city on July 15, "drawn and quartered," and the parts dipped in pitch and set up in populous centres of the rising. Geoffrey Litster, leader of the revolt in Norfolk, a dyer by trade, and Westbroom, "king of the commons" of Suffolk, with several hundreds more, were executed. The whole number of executions amounted to 1,500.

While these events were passing in London and its neighbourhood, the servile war had spread over a great part of England. The nobles shut themselves up in their strong castles, but Henry Spencer, the Bishop of Norwich, armed his retainers, collected his friends, and kept the field against the insurgents of Norfolk, Cambridge and Huntingdon. He surprised several bodies of peasants and cut them to pieces; others he took prisoners, and sent straight to the gibbet or the block.

The first great effort on the part of the peasants of England to free themselves from the immediate and personal control which the lords had over them under the system of serfdom, failed through the lack of organisation and the riotous proceedings of the peasants, which evoked retaliation on the part of the upper classes of society, who showed how little they were prepared for the recognition of the rights of the poor by the Parliament annulling the charters of manumission which the king had granted, and by the way the propriety of abolishing villeinage was scouted by both lords and commons. Nevertheless, the Peasants' Revolt, 1381, marked the beginning of a great economic change in England, for the supply of workers being short of the demand, wages began to rise rapidly after the custom began to pay wages in lieu of demanding labour services for land; and of course the free labourer, who sought for employment where he could, lost his title to the land which he had as a serf in return for his labour. The difficulties of the landowners to obtain labour cheap enough to carry on arable agriculture at a profit caused a number of landowners to turn their land into pastures for sheep-rearing, the

wool being in great demand in Flanders; and from this sprang the weaving of wool in England by Flemish weavers protected by Chartered Guilds from outside labour, this trade growing tremendously in England from the thirteenth century; and the weavers, to protect themselves from unfair dealings of merchants, were the first to *strike* effectively in the British Islands.

In marked contrast to the weavers stand out the peasants of England to free themselves from the immediate and personal control which the lords had over them under the system of serfdom, to demand the right to sell their labour for wages, in place of paying their rents in labour services, to obtain the right to move about freely so as to find the best possible market for their labour, in place of being tied down to the lord's estate, to obtain the right to sell their produce in the markets as free men, and to procure equality before the law which had not previously recognised their right to redress for grievances of any kind in the courts of justice. Truly, these demands for which such sacrifice was made by thousands of English toilers in the Peasants' Revolt, have been won, but the means by which they have been effected, instead of being ascribed to the "riotous priest" of Essex and the "wicked priest" of Kent, whose initiatives were revolutionary, must be accorded to the "poor priests" whose doctrines were reformatory, and consisted in the right of the common people to repudiate their obligations to their lords and masters if in turn the lords did not observe their duties to those who were under them.

Agriculture flourished under the encouragement of the ecclesiastics, they attaining to the greatest height of power 1216-1399, then entering upon their long decline 1399-1485, when ecclesiastical polity is seen losing its hold on the affections and respect of the people, and the fury of the whirlwind which gradually blew over the whole land in the seizure of the abbeys and monasteries was so complete that in the spring of the year 1540 all the monastic establishments of the kingdom were suppressed, and much of their landed property was divided among courtiers and parasites. Pauperism increased, education was neglected, and yet agriculture must have been largely practised outside the monastic establishments and attained some prominence by and in the reign of Henry VIII, for the first English treatise on husbandry was published in 1534 by Sir A. Fitzherbert, Judge of the Common Pleas. It is entitled the *Book of Husbandry*, and contains directions for draining, clearing and enclosing a farm, for enriching the soil and rendering it fit for tillage. Lime, marl and fallowing are strongly recommended. Indeed, there is little in the *Book of Husbandry*, as written from the author's experience of over forty years, which should be omitted, and not a great deal that should be added, in so far as regards the culture of corn, in a manual of husbandry adapted to the present time.

During the reign of Elizabeth agriculture advanced. Tusser's *Five Hundred Points of Good Husbandry* (first complete edition published in 1580) contains much useful information in metre. According to this we learn the farmer of the sixteenth century "had eels in his stew and bees in his garden. Grew his own hops, made his own malt and many of his rough implements. Raised his own hemp, twisted his own cart-ropes, cleaned and spun his flax at home, sold some of his wool to the weaver, and kept the spindle moving on his kitchen floor. Sawed his own timber, built the mud walls round his cattle-yard, was his own farrier and butcher, made his own candles, burned his wood into charcoal, cultivated herbs for physic, which his wife dried or distilled, varied his corn crops by the cultivation of saffron and mustard seed."

In the seventeenth century Charles I resolved to revive the forest laws which had been allowed in good part to drop into desuetude, at least all such parts of that disgraceful code as might tend to the increase of his revenue. The Earl of Holland was appointed to hold a court for the recovery of the king's forestal rights, or those lands which had once belonged to the royal chases. In this manner people were driven from many tracts which they and their fathers had long occupied as their own; gentlemen's estates were encroached upon, and, as the king was the litigant, the opposite party, even if he gained his cause, which in such circumstances he had but slight chance of doing, was distressed or ruined by the costs of the action which he had to pay, whether he was the loser or the winner. The Earl of Southampton was reduced almost to poverty by a decision which deprived him of his estate adjoining the New Forest in Hampshire. In Essex the royal forests grew so large that people said they had swallowed up the whole county. Rockingham Forest was increased from a circuit of six miles to one of sixty miles, and all trespassers were punished by the imposition of enormous fines. "Which burden," says Clarendon, "lighted most upon persons of quality and honour, who thought themselves above ordinary oppressions, and were therefore sure to remember it with more sharpness." To enlarge Richmond Park, Charles deprived many proprietors, not merely of their rights of common, but also of their freehold lands. It would appear that he afterwards gave some compensation, but the act at first had in it all the worst features of a cruel and plundering despotism.

About 1645 the field cultivation of red clover was introduced into England by Sir Richard Weston, author of a *Discourse on the Husbandry of Brabant and Flanders*, and in less than ten years its cultivation had spread over England and made its way into Ireland. Turnips also were introduced by Sir Richard Weston as an agricultural crop. Blythe's *Im improver Improved*,

which appeared during the Commonwealth, treats of the cultivation of clover, recommends turnips as a crop for feeding cattle, and contains the first intimation as to the practice of alternate cropping. After the Restoration agriculture remained stationary for about eighty years.

In the eighteenth century British agriculture was advanced by the practice of Jethro Tull, a gentleman of Berkshire, who began to drill wheat and other crops about the year 1701, and whose *Horse-hoeing Husbandry* was published in 1731. He was the founder of the system of sowing crops in rows or drills in order to admit of tillage between the ridges: turnips, potatoes, etc., being cultivated on his system at the present time. After the time of Tull's publication no great alteration in British agriculture took place till Robert Blakewell and others effected some improvement in the breed of cattle, sheep, and swine. To Blakewell we owe the well-known breed of Leicester sheep. By the end of the eighteenth century it was a common practice to alternate green crops with grain crops, instead of exhausting the land and inviting diseases with a number of successive crops of corn.

In 1754 complaints were made by country gentlemen of the old laws not being sufficient for the preservation of game, poaching being greatly on the increase. During the session a new Game Act was passed through both Houses of Parliament, but it only served to crowd the jails with unqualified sportsmen, who there became qualified for the commission of much more serious offences. The Game Laws, a relic of the old Forest Laws, required a certain qualification to enable any one to pursue and kill game. In the time of James I, the qualifications were £40 a year from land, or £200 in personal property. In the time of Charles II the qualifications were altered to the possession of an estate of inheritance worth £100 per annum, or of a leasehold estate for life, or for ninety years or upwards, worth £150 per annum. By the Act 25 George III, cap. i, it was made incumbent on qualified persons, in order to give them the full right of killing game, to take out a game certificate, that is, to pay a tax for the privilege.

Agriculture received a great impetus to improvement during the wars caused by the French Revolution, 1795-1814, through the high price of agricultural produce, not only in England but also in Scotland. One effect of the high price of agricultural produce was to increase the products of the soil and the rental of the land; the latter in some cases more than doubled during the latter half of the eighteenth century. Societies for the advancement of agriculture were founded in both England and Scotland, and one result of the improvement in agricultural pursuits was a relative increase of four-footed and winged game. Poaching was correspondingly greater, and carried on with the connivance of tenants smarting under higher rents and

devastation of produce, resulting from superior cultivation, by more game.

In 1827 Lord Wharnccliffe introduced a Bill in the House of Lords to modify the invidious and oppressive Game Laws and enable every proprietor of land to kill game thereon, to legalise the sale of game, and to mitigate the severity of the punishment provided for certain offences against the existing Game Laws. It was lost on third reading by a majority of one. In the discussion on the Bill, Lord Harrowby said that, during the last three years, about 4,500 persons had been imprisoned under the Game Laws, while the number in 1810, 1811 and 1812 had been only about 460. Lord Suffield introduced a Bill, eventually carried, for abolishing the barbarous practice of setting spring guns and other engines of destruction for the preservation of game. By the Game Act, 1 and 2 William IV, cap. XXXII, the Game Laws were greatly modified, the necessity for any qualification except the possession of a game certificate being then abolished, and the right being given to any one to kill game on his own land, or on that of another with his permission, the tenant not having any right to interfere with the devastators of his crops as regards game, such act, secret or clandestine, being poaching.

The Royal Agricultural Society of England was established in May, 1838, and in 1840 it was incorporated by royal charter, the object of which was to encourage the art and science of agriculture on the most approved principles. The Royal Agricultural Society of Ireland, instituted in 1841, and other societies, such as the county and district shows throughout the British islands, had similar aims, and agriculture made rapid strides during the time named and subsequently in draining, not only of swampy spots, but extended systematically to whole farms and every field on the farm. Deep ploughing and thorough tillage, together with the introduction of improved implements for carrying out the operations. Labour saving inventions, such as the mowing machine, steam thrashing machine, and the steam plough. Scientific investigations, botanical, physiological, and chemical—the results passed from books into the hands of practical farmers. Artificial manures, increasing the produce of cultivated lands and extending the limits of cultivation. Improved varieties of plants used as field crops, and their rotations. Betterment in all kinds of stock and feeding on more scientific principles. Railways constructed over the country, thus the farm produce, live stock, and manures easily transported.

Up to the year 1843 landlords and their tenants enjoyed the prosperity that befitted their vested interests, but the falling off in the national revenue, marked by a deficiency of considerably over a million and a half on the first quarter, greatly alarmed the country. Trades and manufactures were seriously depressed,

and agricultural products were becoming less profitable, not only because of the reduction in the prices caused by the recent tariff, but in consequence of the alarm of the producers, who seemed unable to bestir themselves to meet the competition which they dreaded from foreign grain. In 1842 the question of the remission of the tax on foreign corn had been agitated with the utmost earnestness. The opposition was violent and continuous, but the necessity of relief from the tax on corn was emphasized by events and the sufferings of the poorer population and the disorders to which want gave rise. The Corn Importation Bill, as it was called, was carried through the House of Commons by large majorities, and finally passed the House of Lords on June 25, 1846.

After the repeal of the Corn Laws and the induction of free trade, the landlords, farmers, small-holders, and labourers rode fairly comfortably for a time on the ebbing tide of prosperity that may be said to have reached its flow in 1845, especially as regarded the vested interests of landlords. The improvements they had effected on their estates in the early part of the century were bringing forth good fruit—higher rents, more game for sport and profit. The farmer and small-holder were in relatively affluent circumstances, and labourers, especially those employed on estates, were well off, having gardens and allotments; but not a few working on farms were hard-set to live, being often themselves and families hungry, ill-clad and badly shod.

The landlords, despite of free trade, did not lose heart, but continued the improvement of their estates, not a few having recourse to loans for effecting the under-draining of land, deepening and straightening water-courses, stubbing old and making new fences, reconstructing homesteads and adding to outbuildings for machinery and storage, and for housing and feeding cattle. The small-holders, however, rarely partook of the landlord's improvements, and labourers were not given work regularly, only those connected with horses and cattle finding constant employment. Many of the more thrifty, healthy, energetic and handy emigrated to the United States and British Colonies, and not a few small-holders and small farmers ceased struggling and with their families migrated to towns, already augmented by influx of strong healthy labourers from the country, in order to obtain work constantly and at higher wages. At this neither the landlords nor farmers took fright—the small holdings could easily be added to adjoining farms, and the small farms merged by large, while the dwellings, if taking in sites and with young orchards coming into profit, with a paddock adjoining, could readily be let to a tenant of independent means at a rent equal to, if not higher, than that previously had for the small holding. Even if a new house had to be erected in place of the tumbledown

dwelling and ramshackle outbuildings, 5 per cent. was assured on the outlay.

The small holdings and small farms were slowly but surely depleted all over the country, either by the old landowners in the manner before mentioned, or by rich commercial persons purchasing estates and erecting thereon new or enlarging existing mansions, with gardens, stables, and home farms, farmsteads, cottages, everything brought up to date, even to the planting of new plantations as compensation for stubbing up old hedges and the encumbering scrubby trees; while in not rare instances much land was planted with the object of sheltering and beautifying, also rearing and harbouring game with a secondary consideration as regarded the trees growing into timber.

The Agricultural Gang Act was passed in 1867 prohibiting the employment of children of less than eight years old in agricultural labour, and in 1871 the country generally was in the height of prosperity, the industrial classes were able to bear a general rise in prices, and a large increase in wages was a prominent subject throughout the year 1872. The agricultural labourers formed the Agricultural Labourers' Union, and though this was followed by a small rise in wages, it was soon clear that the real remedy for the great poverty and distress of the agricultural labourers was to be found in some change in the land laws which would enable the toilers of the fields to acquire small freeholds which they might cultivate in their own interests.

In 1873 the Select Committee to inquire into the Game Laws elicited evidence of the destructive nature of hares and rabbits to agricultural crops. The improvements effected by landowners in the way of beautifying their properties by planting forest trees, mostly quick growing, such as larch, Scots, Corsican and Austrian pines, Norway spruce, and silver fir, to form plantations, clumps and belts, or adding to existing woods so as to render them more game-holding, the old woods being too open at bottom, resulted in great contention between landlord and tenant as to who had first claim to the game. The Ground Game Act was passed in 1880, and was, no doubt, the outcome of the Select Committee on the Game Laws in 1873, accelerated by landowners having much land tenantless.

The Agricultural Holdings Bill, providing for transactions between tenant and landlord with respect to compensations for improvements, was passed in 1875, but was rendered practically useless by landlords being allowed to contract out of its provisions. This, especially on estates over which the shooting was let by landlords over the heads of tenant-farmers, together with the hand-rearing of winged game, became a serious impediment to agricultural progress. Inclement weather and a disappointing harvest in 1879 was seized upon as timely for a reduction of rents,

tenants not being able to go on unless they were granted a fair reduction. It was urged that the passing of the Ground Game Act would afford some relief, the right of killing hares and rabbits being at least a mitigation ranging from 2s. 6d. to 5s. per acre. But it was not much of a concession to the farmer, for the reservation of winged game implied supervision, and despite thereof, offences against the Game Laws increased, there being more convictions for poaching and fowl stealing than other misdemeanours, excepting the Licences Acts, in rural districts.

An Agricultural Holdings Bill for England and Scotland was passed in 1883, the previous harvest not having been up to the average, and prospects were dull. The price of corn had fallen to 41s. 7d. per quarter, and in 1884 it dropped to 35s. 8d. Farmers could not grow corn, they said, at a profit under 40s., per quarter ! The Highland crofters, whose grievances were not unlike some of the Irish and English tenants, in so far as they consisted of demands for rental which the produce of the land would not enable them to pay, and the penalty of eviction without any future means of living. An additional hardship to the crofters was found in the enormous extension and eager acquisition of land by the proprietors of already existing deer-forests and tracts of country devoted to sport. Two million acres in the Highlands, once devoted to pasture, over which the crofters' cattle used to roam, are now entirely used for the artificial maintenance of deer in a wild state. Then there has been a consolidation into large sheep-farms of the superior classes of pasture which used to be grazed over by the mixed sheep of the small owners. Thus the men, with knowledge of pastoral and agricultural processes, and equipped in some degree with the stock and implements of husbandry, were debarred from becoming substantial occupiers of small holdings under lease, or to be the managers of land belonging to themselves ; and the cottars and crofters were not relieved by the Commission of Inquiry or resolution of Parliament in 1884.

The small holdings in England had practically disappeared from rural districts in 1885. The actual loss of arable area in the interval covered from 1875 to 1895, which may be said to cover the period of agricultural depression, was 2,137,000 acres, and of this corn (wheat is that meant in this connection) growing accounted for more than 1,900,000 acres. The increase of cattle, sheep and pigs hardly accords with the extended area under grass, while it represents at least one-fifth less hands employed on farms, and in conjunction with the displacing of labour through the introduction of machinery, reduced the labour needed on farms, together with the landowners suspending improvements on their estates, fully one-third. Thus the rural districts were depopulated, and for what ? The bogey of protection !

The loss of the allotment and small-holder in rural districts

appears to have been partly due to the antipathy of the local authorities, for allotments and small holdings have been in vogue from the earliest times, and the provision of land for labourers has long been a recognized principle of English law. The Poor Law of Elizabeth gave power to the overseers to acquire land for allotments, and during her reign, and also that of Queen Anne, areas under cultivation by labourers were greatly extended, the labourer ever taking a chance of bettering himself on his native soil, and experience has shown that he makes very good use of it.

The power granted by Elizabeth was extended by an Act passed in the last year of George III's reign, which gave the churchwardens and overseers power "to provide land for employment of the poor to an extent not exceeding twenty acres." This was extended to fifty acres by an Act passed in the last session of the unreformed Parliament, which also gave power to the churchwardens and overseers to enclose waste and common land with the consent of the lord of the manor, or belonging to the Crown. These Acts also gave the parish authorities power to find land on which to employ the poor—an early recognition of the "right to work" and live.

The first "Allotments Act" was passed in the very last days of the unreformed Parliament. It provided that, when enclosure Acts were passed, the parish vestry might let portions of the land set aside for the use of the poor, to cottagers in allotments of not less than one acre in extent. This Act was amended, and the powers under it increased, by another Act passed in 1873. Its principle was further extended by Mr. Jesse Collings's Allotment Act of 1882. This Act enacted that the trustees of the parish charity funds should offer them to cottagers and labourers in allotments of not more than one acre. The statute was fenced round with many restrictions, but in spite of this it did good work in many parishes—practically founded the small allotment system of a few perches in area, say from 10 to 20 perch plots, of great value to artisans and others in towns for the growth of vegetables, and also in villages the residents of which had not sufficient ground attached to their dwellings for the production of vegetable crops equal to the requirements of the household, besides affording profitable employment for leisure time. As to the former Acts, intended to benefit toilers on the soil, they seem to have fallen into disuse.

"Three acres and a cow" controversy and the elections in 1885 and 1886, the first in which the agricultural labourer had a vote, awoke the country to the importance of keeping the labourer on the land, and certainly aimed at establishing "peasant proprietors." Nothing, however, was done until the Spalding election in 1887, when the Unionist Government hastily introduced the Allotment Act of 1887. This Act

enabled the sanitary authority of any urban or rural district, on a requisition from six ratepayers, to provide allotments limited to one acre. The authority had power to take land compulsorily for this purpose. But the machinery of the Act was so cumbersome and expensive that very little use was made of it. In order to acquire land compulsorily, a provisional order had to be obtained, which was practically an Act of Parliament. And when this course was taken, it was found that the legal expenses exceeded the value of the land. The Act was amended in 1890 by another measure, providing an appeal to the county council. Sir Henry Fowler's Local Government Act of 1894 extended and simplified the powers of local authorities. Parish councils were empowered to acquire land for allotments, and there was an appeal to the county councils. Parish councils were also enabled to hire land for allotments, the rent to be fixed by a single arbitrator appointed by the Local Government Board.

In 1892 Mr. Henry Chaplin succeeded in passing his Small Holdings Act, which gave power to the county councils to purchase land for small holdings of not less than one and not more than fifty acres in extent. The purchaser was to pay one-fifth of the purchase money down, and repay the remainder in equal annual instalments. The great defect of the Act is that it confers no compulsory powers on county councils, and with a few exceptions it has remained a dead letter.

This, then, is the machinery in existence up to 1907 for the provision of allotments and small holdings, and that it failed to satisfy the land hunger of the agricultural labourer is shown by the working up to 1894. Out of the 419 rural sanitary authorities only 83 had taken advantage of the Act of 1887, and 12 county councils. These had provided 1,836 acres of land and 413 acres respectively, which supplied allotments to 5,536 tenants. Then came the Parish Councils Act, and under it 18,601 acres of land was provided for 45,393 tenants in various parts of the country. By the first Allotments Act of 1887 to the year 1902 the acreage provided by local authorities was 20,850, and the number of tenants 50,927. This, of course, takes no account of the extension of the private letting of allotments, nor of the work done by Mr. Jesse Collings's Act of 1882.

Small holdings, as distinguished from allotments, show a poor result from Mr. Chaplin's Act. The acreage brought under the Act is only 220, and the tenants 136. All these figures are taken from the latest report of the Local Government Board which goes no further than March, 1902.

The greater part of land acquired by local authorities has been hired by agreement, the compulsory purchase clauses have only been put in force in two cases, and in one of these—the St. Faith's case—the experiences of the Norfolk County Council were

of such a kind as to effectually deter any other local authorities from putting into force the powers it is supposed to possess. Some parish and district councils, however, have put into force their compulsory hiring powers under the Local Government Act of 1894. But the whole method of obtaining land by local authorities was hampered by the gentlemen who were elected to the local authorities not being in sympathy with the demand for allotments and small holdings, the labourers not being so alive to their own interests as to get their own representatives elected upon them.

The Small Holdings and Allotments Act, 1907, came into force on January 1, 1908. This Act has several important provisions. It gives county councils compulsory power to hire, as well as buy, land for small holdings. The rent or price of the land is to be fixed by a single arbitrator appointed by the Board of Agriculture, in case no agreement is come to by voluntary arrangement. The management of allotments is taken out of the hands of the district and given to the parish councils, and the size of an allotment is increased to five acres.

In case county councils take no steps to put the Act in force when asked to do so, the Board of Agriculture can take action. Two Small Holdings Commissioners have been appointed to see that the local authorities do their work. The Treasury has made a grant of £100,000 a year towards the expenses of these commissioners. There are provisions in the Act which ensure that the local authorities shall report every year to the Board of Agriculture as to the demand for small holdings and allotments, and the steps which are to be taken to supply them.

The Small Holdings and Allotment Act, 1907, may be regarded as the Peasants' Land Charter, and likely to re-establish small holdings in England to as great, if not greater, extent than existed in the middle of the nineteenth century, thus placing it on an equality with Wales, where, out of 65,000 holders of land, over 48,000 hold less than fifty acres, and the Act being extended to Scotland, whether on the hire or purchase system, security of tenure being accorded, there is no question of the success of allotments and small holdings restricted to occupation by persons possessed of practical knowledge of economic agriculture and horticulture. This, however, is contingent upon the crops being favoured by natural aids and the cultivators safeguarding them.

GARDENING. During the time of the Roman occupation, through Saxon and Norman down to Magna Charta, horticulture appears to have been co-operative with agriculture, and to the total dismantling of the abbeys in 1540 was confined to the monasteries and baronial castles in a great degree. In this demolition not any of the abbeys were spared, except in cases where they hap-

pened to be parish churches also ; as was the case at St. Albans, Tewkesbury, Malvern, and elsewhere. At the first-named place lived the earliest English author who treated on the subject of gardening. This was Alexander Necham, master of the grammar school at St. Albans, at the end of the twelfth century, and afterwards abbot of Cirencester. He was born about the year 1157 and died in 1217. His work, "De Naturis Rerum," largely compiled from the Roman agricultural writers, yet notices varieties of fruit which were then cultivated, as the St. Régie pear, and also enumerates apples, chestnuts, peaches, almonds, and figs, all of which, no doubt, were cultivated in the abbey orchard. From him we learn that the process of grafting was then, as now, generally practised, but he makes no mention of the vine ; hence we conclude the Romans had not a vineyard at Verulamium, or one in Saxon and Norman times in the monastic domain of St. Alban's Abbey. The first Earl of Salisbury, however, planted a vineyard at Hatfield, which is noted as being in existence when Charles I was taken there as a prisoner.

Other gardening works in manuscript, followed by printed works, appeared in rapid succession. Gerard's Great *Herbal* was issued from the printer's hands, 1577. Wheat in 1596 was five guineas the quarter, and Lord Burleigh spent ten pounds per week in giving the poor employment in his garden at Theobalds in Hertfordshire. After Gerard came John Parkinson, who published his delightful folio *Paradisus Terrestris*, or a Garden of Pleasant Flowers, in 1629. Philip Miller's *Gardener's Dictionary* appeared in folio in 1731, and John Abercrombie's *Every Man his Own Gardener* in 1770.

In the nineteenth century gardening made rapid strides. John Claudius Loudon began to practise as a landscape gardener in 1803, and though, like Tusser and Arthur Young, failing at farming, advanced horticulture by his works, especially his *Encyclopædia of Gardening*, 1827, and his *Encyclopædia of Plants*, 1829, also his *Encyclopædia of Agriculture*. These, with his other works, mark a distinct epoch in both our farm and garden literature, with which farming and gardening went side by side, acting and reacting most beneficially in the evolution of agriculture and horticulture.

The establishment of the Horticultural Society of London (now the Royal) in 1804 under the auspices of Sir Joseph Banks, Mr. (afterwards Sir) T. A. Knight, and other eminent scientific and practical horticulturists, gave an impetus to gardening and garden literature that is even yet not exhausted, but even more and more extending in scientific and practical gardening. Indeed, in the present state of horticulture England is ahead of all other countries in the taste for general gardening. The grounds and gardens attached to the residences of the nobility and gentry are replete with esculent vegetables, fruits, and ornamental plants,

indigenous and exotic, hardy and warmth-requiring. The gardens at Kew, near London, contain a collection of plants which is unrivalled in any other country. London and all the great cities and towns of the British Islands have parks and recreation grounds replete with trees, shrubs, and plants, some with "winter gardens"; even cemeteries are ornated with sylvan shadows and floral wreaths as well as monuments. Public institutions, such as hospitals and "homes," are decked in lawn and arboreal garniture, hotels and retreats made pleasant without and sumptuous within by beauties and dainties culled from home or market gardens. Everywhere the eye is constantly struck with villas and cottages embowered amidst ornamental trees, shrubs and flowers, while in the rears are found neat compartments devoted to fruit trees and vegetables, with, in many instances, glazed and heated structures for growing plants requiring protection or more warmth than that of the British Islands. Even windows are utilized for the growth and display of exotic flowering or foliage plants, and balconies bedecked in summer with trailing and gorgeous flowers, and in winter enlivened by evergreens. In the so-called "slums" of large towns may be seen the thrifty London Pride, roof-top Houseleek, and window "Balm of Gilead," pushing greenery and emitting fragrance derived from mould (of a sort) in an old teapot minus spout or handle, in an atmosphere of murkiness and gloom scarcely pierced by meridian sun. Truly, Britons are gardeners—lovers of nature.

Success in all the cultures named depends upon the following practical points being strictly regarded: first, securing a market for produce. Secondly, suitability of land or water and environment for the purpose intended. Thirdly, practice of clean culture. The culture otherwise must fail, no matter how energetic, industrious resourceful, qualified and experienced the cultivator may be, and this quite apart from the militating influences of the conjoint interests pervading all the avocations which have to be carried on in accordance with legislative enactments in order to promote the national welfare.

Sporting, fishing, forestry, farming, and gardening are promoted and safeguarded by the electorate through the legislature and Government as considered most conducive to meeting the needs of the nation as a whole, and in behalf of each culture compromises have to be effected between the conflicting interests, so that they may be pursued without material prejudice, if not in some respects benefit, to one another. This implies contention on the part of the respective culturists with the wild or semi-wild land vertebrates, which directly or indirectly feed upon the produce of the soil or water, and are either helpful or hurtful to cultivated crops. The first demand national and international protection, and the latter decimation all round, even the *neutral* must, when

unduly numerous, be limited in number, lest they inflict more damage than they contribute in benefit. To aid the judgment in arriving at equity in these important concerns, the habits and food of the chief wild creatures that still roam over the British Islands are given as consonant with experience, and by this data, balancing the good they do against the evil they commit—essential service may be rendered to the several pursuits by exercising discriminating judgment with a view to the success of each and all, and thus the animal and vegetable produce be increased to the profit of the rearers and growers and welfare of the whole inhabitants of the British Islands.

Part I

GENERAL HABITS

CHAPTER I

WILD ANIMALS

INSECTIVOROUS AND HARMLESS

CHEIROPTERA, or Bats, an order of mammiferous quadrupeds, characterized by having the tegumentary membrane extended over the bones of the extremities in such a manner as to constitute wings capable of sustaining and conveying them through the air, hence the name of *cheiroptera*, or hand-winged. The order is divided into two sub-orders *Frugivora* and *Insectivora*, the former insecti-frugivorous, and the latter purely insectivorous. All have exceedingly sharp-cutting and acutely tuberculated teeth, and the whole race is nocturnal. They vary in size from that of the smallest common mouse up to that of the gigantic ternate bat, whose body is as large as that of a squirrel. The smaller species are abundantly distributed over the globe; the larger seem to be confined to warm and hot regions, where they exist in great numbers and are very destructive to the fruits. The purely insectivorous species render great service to mankind by the destruction of vast numbers of insects, which they pursue with great eagerness in the morning and evening twilight. During the daytime they remain suspended by their hooked hinder claws in the lofts of barns and other buildings, in hollow or thickly-leaved trees, etc. As winter approaches, in cold climates, they seek shelter in caverns, vaults, ruined and deserted buildings, and similar retreats, where they cling together in large clusters, and remain in a torpid condition until the returning spring recalls them to active exertions. In warm climates, where a constant succession of insects occurs, the same species of bat, which in a cold region would become torpid, continue in activity throughout the year. Bats generally bring forth two young, and suckle them until old enough to purvey for themselves. While suckling, they remain closely attached to the mother's teats, which are two, situated upon the chest. The parent shows a great degree of attachment for her offspring,

and, when they are captured, will follow them, and even submit to captivity herself rather than forsake her charge. The voice of the small bats, when irritated, is a sharp chattering sort of squeak; they bite with much force, and those of considerable age and size can inflict a very severe injury. The "nesting" or breeding places of bats are usually the roofs of buildings, between the slates or tiles and ceiling, and commonly by the eaves, where in one instance of a "nest" in the roof of a pavilion in a public park the wings of lepidopterous insects were swept up from the floor, filling a peck measure, the bodies being consumed by the parents and young of a single "nest."



FIG. 1.—BATS: COMMON OR PIPISTRELLE, LEFT HAND; NOCTULE, LOWER-MOST; LONG-EARED, UPPERMOST.

The British bats are represented by the Insectivorous section of the Cheiroptera or Bat order; and included in the family of the Vespertilionidæ or True Bats, are the species shown in the illustration, Fig. 1.

COMMON BAT or PIPISTRELLE (*Vesperugo pipistrellus* or *Vespertilio Pipistrella*), Fig. 1, left-hand figure. This familiar little bat occurs throughout Britain, and flits about during twilight alongside of woods and in woodland glades, about farmsteads and buildings, in bye-roads and highways, in villages and towns, even visiting the most ornate halls, churches and cathedrals in quest of food, which

consists of insects of various kinds, but chiefly dipterous. It is said to be also partial to meat, and has been found in larders and pantries feeding upon joints! The *Pipistrelle* inhabits the crevices of walls and old buildings throughout the day. It passes the winter in a state of torpidity, but appears to hyper-nate for a shorter period than other and larger species.

DAUBENTON'S BAT (*Vesperugo Daubentoni*) frequents aquatic situations, and feeds upon gnats and other insects found in low-lying places.

MOUSE-COLOURED BAT (*Vespertilio murinus*) is local in distribution and found in or about buildings, and feeds upon nocturnal lepidoptera or moths.

NOCTULE BAT (*Vesperugo noctula*), Fig. 1, lowermost figure, dwells in hollow trees, woods, pleasure grounds, and elsewhere in similar retreats, feeding largely upon cockchafer (*Melolontha vulgaris*), gardenchafer (*Phyllopertha horticola*), and rosechafer (*Cetonia aurata*), fifteen chafers having been found in the stomach of one bat.

LONG-EARED BAT (*Plecotus auritus*), Fig. 1, uppermost figure, is found in woodlands and on heaths where trees exist, feeding upon small lepidoptera, beetles, and flies, always rejecting the head, legs, and wings.

In geological time the bats range from *Eocene* tertiaries down to the present, the *Vespertilio* being amongst the earliest and most common forms. In the caves and caverns of some countries the accumulated excreta of vast numbers of bats is so considerable as to have commercial value as bat guano, which, according to Dr. Voelcker, contains nitrogen in three forms: first, as organic matter; secondly, as ammonia salts; and thirdly, in the form of nitrates. It also contains over six per cent. of phosphoric acid, and twelve per cent. of lime, and is chiefly sent into commerce from Texas, United States of America.

SHREW-MOUSE. The Shrews belong to the order *Insectivora*, and form the family *Soricidæ*. They are known by their hairy bodies, and by having the feet formed for running, eyes well developed, ears present but usually small, jaws prolonged, and a mobile snout exists. The typical species are European in distribution and the following are found in Great Britain.

The COMMON SHREW or SHREW-MOUSE (*Sorex tetragonurus* or *S. araneus*), Fig. 2, averages about four inches in length, the tail making up half that measurement, and this appendage is of square shape. It is readily distinguished by its prolonged muzzle and by the teeth being coloured brown at their tips. It feeds upon insects and their larvæ, and inhabits dry places, making a nest of leaves and grasses. The young, numbering from five to seven, are born in the spring. These little animals are very voracious in their habits, and frequently kill and devour one another. The Shrew-

mouse, however, secretes a fluid of a disagreeable odour in special glands, and this odour prevents larger animals from eating their flesh, although they are not infrequently killed, probably being mistaken for ordinary mice. In the autumn, numbers of these little animals may be seen lying dead, but what causes this destruc-



FIG. 2.—THE COMMON SHREW OR SHREW-MOUSE.

tion is not known. In former days the bite of the Shrew was accounted of a venomous kind, whilst its body, variously treated, was regarded as a cure for many complaints.

The WATER SHREW (*Crossopus fodiens*), Fig. 3, attains a total length of from $4\frac{1}{2}$ to 5 inches. The ears are very small. Its colour

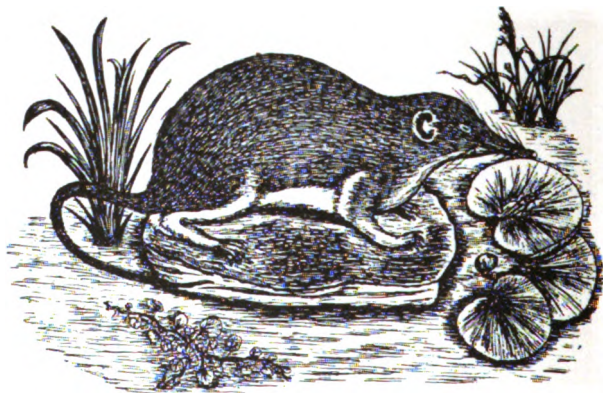


FIG. 3.—THE WATER SHREW.

is black on the upper and white on the under parts. The fur is of delicate texture, and adapted to resist the action of water. It is of active habits, diving and swimming with great facility, frequenting brooks and clear-running ditches, in the banks of which it lives. It eats the larvæ or grubs of various aquatic insects, and is to the water what the Common Shrew is to the land.

The OARED SHREW (*Crossopus ciliatus*) is the largest of British Shrews ; its total length averages from $5\frac{1}{4}$ to 6 inches, and it derives its popular name from the hinder part of the tail being flattened like the blade of an oar. The term of "Black Water Shrew" has also been given to it on account of the black fur of its back, which is sprinkled with whitish hairs, while that of the belly is interspersed with hairs of a blackish tinge. It and another species of Shrew found in Ireland, called the RUSTIC SHREW (*Corsira rustica*), feed upon insects or their larvæ, but they also appear to feed on vegetable matter.

PARTLY USEFUL AND PARTLY INJURIOUS

The BADGER (*Meles taxus* or *M. vulgaris*), Fig. 4, belongs to the family Felidæ, sub-family Mustelina or Weasels, and is about 2 ft. 3 in in length. It has a broad, white stripe from its forehead down to the nose, with a longitudinal black stripe between the eye and snout, on each side, dilating as it goes backward until it includes the eye and ear, behind which it terminates. The hair covering the body is harsh, long, scattered, and of three colours, white, black, and red, differing in the proportion of these tints in different parts, black predominating on the inferior. Legs short and stout, paws provided with long curved claws, especially adapted for burrowing. The female brings forth three or four at a litter.



FIG. 4.—THE BADGER.

On the whole, the badger is a harmless creature, seldom seen unless hunted for, though its haunts are betrayed by the animal's strong smell, due to its having a pouch beneath the tail, from which a fetid fatty humour exudes. During the daytime the badger lives in deep, winding burrows, reposing on a very comfortable bed of hay and grass. At night it comes out to feed in thickets, banks or woods, where it dwells, the food consisting of slugs and

snails, frogs, worms, grubs and adult insects, varied with earth-nuts and roots of various plants, such as wild hyacinth, beech-mast, wild fruits, and herbage. In season, it also feeds upon young rabbits, unearthing them while in "nest," very young hares, young and small birds, eggs of all sorts come-at-able, and with a "sweet tooth" for the nest of the humble bee as well as that of the wild honey bee, devouring the honey and combs. It, however, does very little injury, even to game.

When attacked by dogs or other enemies, the badger defends itself with great resolution, and inflicts many severe wounds on the aggressors before it is finally vanquished. It was formerly and sometimes now is cruelly made sport of by dog fanciers, who place it in an improvised hole in the ground or a long box, and set their favourites to draw it out. The skin of the badger is rather valuable, the hair being used in the manufacture of brushes, and its skin in is some request for holsters.



FIG. 5.—THE HEDGEHOG.

HEDGEHOG (*Erinaceus europæus*), Fig. 5, is a native of most of the temperate parts of Europe and Asia, and recognised by having the body covered with spines instead of hairs. It belongs to the same family, Talpidæ, sub-family Erinacina, as the Shrews, and has a long nose, the nostrils bordered on each side by a long flap, ears short, rounded, naked and dusky; the hind feet have five toes, the upper part of the face, sides, and rump covered with strong, coarse hair of a yellowish ash colour, the back with sharp strong spines of a whitish tinge with a bar of black through the middle. The animal is about 10 in. long, the tail about 1 in. The female produces four or five young at a birth, which soon become covered with prickles.

The hedgehog resides in woods, coppices, thickets, hedges, and shrubberies, whence it frequents fields, orchards and pleasure grounds at night in quest of food. This consists of worms, slugs,

snails, large insects and larvæ, small vermin, roots, especially those of plantain, fallen fruits, and, in season, eggs of ground-nesting wild birds, game, and poultry, also weakly young birds and small animals; indeed, it is very fond of flesh, either raw or cooked. In winter the hedgehog wraps itself in a warm nest, composed of moss, dried hay and leaves, and remains torpid till the return of spring. When attacked by other animals it defends itself by rolling up, and thus exposing no part of the body that is not furnished with spines. It may be domesticated to a certain extent, and has been employed to destroy cockroaches. (See Useful Helps, p. 250.)

Although hedgehogs have been asserted to suck cows and injure their udders, this is equally false with the imputation that they mount fruit trees, and come down with apples, pears, etc., stuck upon their bristles. There is a certainty, however, of the flesh of hedgehogs being good eating, and the skin was formerly used for the purpose of napping cloths. The species found in bone caves (*Erinaceus fossilis*) is scarcely to be distinguished from the common living species.

The MOLE (*Talpa europæa* or *T. europæus*), Fig. 6, is the type of

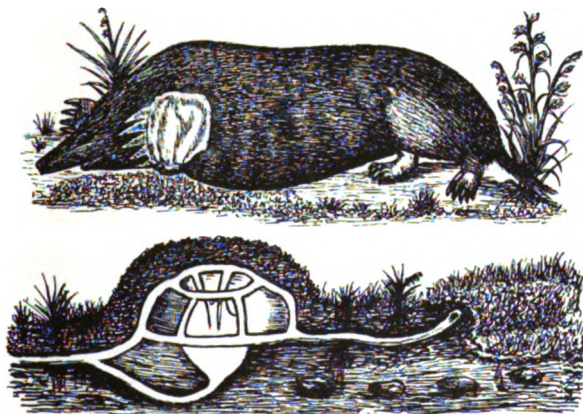


FIG. 6.—THE MOLE AND MOLE HILL.

the family TALPIDÆ, which is included in the order INSECTIVORA. The body is covered with thick glossy hair of furry consistence. The toes are five in number to each foot, and furnished with strong claws of curved shape admirably adapted for burrowing. The fore-feet are of peculiar form and the palms turned backwards and outwards so as to scoop out the earth from the burrow, whilst the hinder limbs are used to throw the material behind the animal as it burrows forward. The eyes of the adult mole are rudimentary and functionally useless, whilst external ears are wholly wanting,

yet the internal ears are perfectly developed, as also is the olfactory sense. In length the common mole measures on an average about 4 in. The female brings forth four to six young, about the month of April, and these are lodged in a special nest prepared by the parents, and lined by young grass and soft roots.

Moles live in pairs, the habitation, formed under an hillock, Fig. 6, lower figure, consisting of an upper and lower gallery, which communicate by five passages, the principal chamber being contained within the lower and larger gallery, from which the mole can escape, either by the high road of the upper or lower gallery, and which lead to the hunting grounds. The burrows in these are sometimes superficial, as in summer, when worms are near the surface, and at other times, as in winter, the burrows are deeper, and often of considerable depth, assumedly to secure water in situations at a far distance from a brook or ditch. Each mole or pair has its own hunting grounds, yet there are high roads connecting the different hunting grounds with each other, which may be used by individuals in common, but if two moles meet, either one must make speedy retreat, or an encounter takes place, resulting in the vanquishing of the weaker.

The mole is common in England, Wales and Scotland, but is said to be comparatively rare in Ireland. It inhabits or frequents woods, copses, commons, moors, and waste places, hedgerows and ditches, pastures and meadows, arable land, parks, pleasure grounds orchards and gardens. In these locations the mole tunnels in various directions and varied depths in quest of food, which consists of worms, insect larvæ, notably wireworm, cockchafer grubs, and other root-devouring pests. By its burrowing it cuts the roots of plants, these being uprooted by the surface runs or covered up by the hillocks, hence in gardens, allotments, and arable land the mole is an intolerable nuisance, indeed, in all cultivated land and well-kept grounds. In pastures and meadows the mole may be tolerated in winter and early spring, when the greater proportion of mole-hills are thrown up, and if the mounds are spread just before the fields are closed for hay, few more will appear, as in summer the mole works near its breeding place, such as a hedge-bank, where, in the ditch and its sides it finds sufficient food. Besides, the mould upcast by moles dispersed by chain and brush harrowing acts as a sort of top-dressing and benefits grass land. The retirement of moles in summer to damp, shady places for feeding, such as ditches and hollows by or in woods and copses, marks the measure of its usefulness in these locations as most pronounced, where, and in waste places, the balance of nature is not materially affected by cultivation, and from whence incursions are made by predatory pests to the prejudice of the cultivator of the soil. Thus the mole is useful, inasmuch as all the grubs it destroys in woods, copses and waste places are kept from adult stage, when they take flight

and invade cultivated ground, doing more harm by their larvæ than the mole, kept within bounds, itself commits by tunnelling, underdraining, aerating, and top-dressing the ground, blending the subsoil constituents with the surfacing débris.

The WEASEL (*Mustela vulgaris*), Fig. 7, a species of carnivorous mammals, belonging to the family Mustelidæ, is characterized by an elongated body, about 10 in. long in the male and 8 or 9 in the female; head, long; legs, short; feet, each five toes; muzzle, rounded; body, bright brown on the upper parts, the under parts white; and tail tinted uniformly with the body. It is a highly courageous animal, and attacks mice, rats, and voles, hares and rabbits—the five worst enemies of the forester, farmer, and gardener. On the other hand, the weasel is very fond of young partridges and pheasants, also chickens, and even pigeons, hence those interested in game and poultry-rearing regard it as only deserving of extermination. Albeit, the weasel destroys vast numbers of rodents or



FIG. 7.—THE WEASEL.

gnawing animals, and in this respect confers more benefit than damage on the farmer.

The male weasel is so small that it can pass along mole runs easily, not perhaps so much in quest of this animal as for the grass mice or voles frequently harboured in forsaken mole-tunnels; we have caught weasels in traps set for moles, while the female weasel is so wonderfully slim as to follow field mice underground. In hedgerows mice and even rats find no abiding-place where the weasel exists, and in cornstacks, often at a distance from the homestead, there is no tunnelling of them by mice and rats when weasels guard the environs; while in case of rats and mice in possession of a wheatrick, a weasel's appearance on the scene implies a speedy clearance. In grassy places where voles, or so-called field mice, are fostered the weasel is earnest in its breeding season, bringing mice for the young at the rate of four per hour in one instance of observation, while the rodents passed out from the grassy places and invaded the adjacent cultivated ground, the weasels being such

persistent mouse-hunters. On moorlands and hill pastures there is no greater benefactor to the grazier than the weasel, and to the forester its services are invaluable; while to the gardener and even the farmer in woodland districts, with a reservation in respect of incursions into poultry yards, the little animal is extremely useful, for "neither mouse nor rat nor mole can carry on their projects with impunity while the weasel stands sentinel" (Waterton).

DESTRUCTIVE

Fox (*Canis vulpes* or *Vulpes vulgaris*) Fig. 8. This (only wild representative of the Canidæ left in the British Islands) is unquestionably an unmitigated pest and nuisance in the mountain districts of northern Britain where no fox-hunting is practicable; hence only the forester and gardener has use for the animal in such locations, the hares, rabbits, rats, mice, and moles destroyed



FIG. 8.—THE FOX.

being considerable. In wild districts weakly sheep, lambs, ptarmigan, grouse, wild fowl generally, and even young roe, as well as those just named, fall a prey to the fox. In hunting localities foxes feed largely on leverets and rabbits (unearthing young in the "nest"), on brooding pheasants and partridges, even their eggs, and among young coop-reared pheasants makes fearful havoc. In the poultry yard the fox is pre-eminently the worst enemy, and, though nocturnal in habits, will carry off the unwary duck or hen in broad daylight during the season his family are dependent on him, often clearing a whole parish of out-sitting ducks and hens.

But the fox feeds upon rats, mice (common, long-tailed and short-tailed), and worms, snails, frogs and beetles, so that the work

is not altogether against the farmer, who often has himself to blame for the inroads into the hen-roost by not taking the precaution to exclude the marauder. Similar remarks apply to pheasant and poultry-rearing grounds, where the fox's incursions may be much checked, or altogether prevented, by care and precaution. Thus the fox may be left to gratify its "sweet tooth" by feeding on the honey of wild bees and to give hounds a merry cry, with a healthy and life-giving exercise to the followers. In districts where there is no fox-hunting, and even where there is, when foxes are allowed to multiply unduly, it is right and proper to keep the fox in check; but it is well to remember that decrease of the animal means an increase of the hare and rabbit, game-preserving uncombined with fox-hunting being a greater evil than a judicious preservation of foxes.

Regarding the damage done by fox-hunters in galloping across newly sown wheatfields and other crops, including the breaking of fences, we can only say that no fox-hunter worth the name gallops across nursery grounds, land under spade husbandry, such as allotments and market gardens, over lawns and other well-kept parts of the demesne, or does wanton damage in fields and woodlands, for the simple reason that he, as a landlord, or farmer, or both, "does as he would be done by," making no gaps where none, or only dead fences, exist. Indeed most gaps are made by blackberry gatherers, nutters, and other town nondescripts, who, as pleasure seekers, cannot keep from cultivated land and cull things they would consider as stolen if practised in their own gardens.

In sandy soils foxes excavate considerable burrows or "earths," and in these, or rocky places, the young are almost always brought forth, although a vixen has been known to select a hollow tree, or a straw stack, and being near a farmstead the excursions to the poultry yard may be disastrous, when timely notice to the huntsman is sure to bring prompt relief by removal, if possible, of the litter, with recompense for damage in due course.

The MARTEN (*Martes (Mustela) sylvestris* or *M. foina*), Fig. 9, is included in the Mustelidæ or Weasel family, the body being elongated and slender, legs short, feet provided with five toes, armed with sharp claws. The marten breeds in hollow trees, and produces from three to seven young at a birth.

Arboreal in habits, climbing trees with great ease, the marten frequents the larger ranges of woodland in preference to the open country, and is an expert at catching birds, robbing nests of young as well as eggs, a great enemy of squirrels, particularly their young, hence a benefactor to the forester in woods, especially beech and pine, but very destructive to game, both ground and winged; also visits farmyards, killing poultry, and pigeons. It, however, destroys mice, moles, rats, and voles, and it is said to be fond of

honey, and to even eat fruits and grain. The fur of the marten bears some resemblance to that of the sable, but is inferior to it, though a considerable number of skins are imported into England from the North of Europe.

The PINE MARTEN (*Martes abietum*) inhabits the pine forests of



FIG. 9.—THE COMMON MARTEN.

continental Europe, and is not, as formerly supposed, a British species. It is of smaller size than the common marten, with a yellow mark on the throat, and has a finer fur, which is used for trimmings.

The POLECAT, FOUMART or FITCH (*Mustela putoria*), Fig. 10, like most other members of the Mustelidæ, has an elongated body and short legs, muzzle shortened, skull triangular, neck long and flexible, ears small, eyes large, and the senses of smell, hearing, and sight very acute. The anal glands which are placed close to the base of the tail secrete a fluid of highly unpleasant odour, disagreeably permanent in contact with clothing or other material. The

adult measures from 16 to 18 in., and the tail 4 to 5 in.; fur dense in the under-coat outer; and hairy, of a yellow colour, with the tips of the longer hairs dark brown; edges of ears and fur surrounding lips white. The young, produced in spring, number three to five.

The fourmart inhabits woods and hedgerows, living in burrows,



FIG. 10.—THE POLECAT.

and lining the nest with dried grass or similar material. It is very destructive in game preserves, partridges and pheasants, hares and rabbits falling victims to its blood-thirstiness, while its ravages among fowls and ducks, geese and turkeys (young) are appalling, for it kills only to suck blood and eat brains, leaving the bodies and flesh untouched. Fish, particularly eels, also fall a prey to its rapacity, while mice, rats, and voles are speedily destroyed by it. The fur of the polecat is worn under the name of "fitch," the Scotch skins being regarded as the finest.

STOAT OR ERMINE (*Mustela erminea*), Fig. II. This beautiful little animal is the *Mus Ponticus* of Pliny, and in habits very similar to the common weasel, hence, by some, considered to do as much good as harm, and should be included in the "Partly Useful and Partly Injurious" section. In summer it is of a light ferruginous or chestnut-brown colour over the head, back, sides, and upper half of the tail; the under part is nearly of a pure white, the lower portion of the tail becomes gradually darker, till at the extremity it is quite black. The fur is short, soft, and silky. In its winter coat it is pure white over the whole body, the lower part of tail only retaining its dark colour, and at this time the fur is much longer, finer, and thicker than in summer. The fur is in great request, formerly as insignia of kings, and is still used by judges.

The stoat frequents woods, copses, and hedgebanks, also barns and outhouses. It feeds on mice and rats and voles, soon clearing infested places of these pernicious depredators, being among the deadliest and most persevering of small rodent enemies. Hares may not often fall victims to its rapacity, but it is a terrible enemy to rabbits, and has a particular penchant for young pheasants and other winged game, not even sparing the brooding pheasant or

partridge, and a great devourer of eggs. In the henroost and dovecot it is very destructive, its ravages outweighing the services rendered by destroying rodents in the hedgebanks in summer and stackyards in winter. The stoat, like most of the weasel family,



FIG. 11.—THE STOAT OR ERMINE.

hunts by "nose," following the scent of rats or rabbits with the greatest pertinacity. It is also capable of climbing trees, capturing unwary birds, and robbing nests of young and eggs. Frequenting stream-banks in quest of brown rats as well as water voles, the stoat often takes to the water, swimming with ease and rapidity.

The OTTER (*Lutra vulgaris*), Fig. 12, is included in the family of the Mustelidæ or Weasels, but is of aquatic tastes, for which the

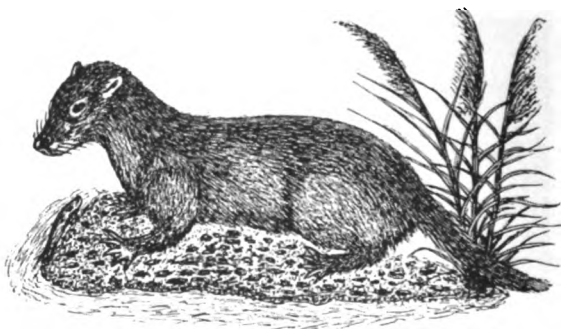


FIG. 12.—THE OTTER.

possession of webbed feet admirably adapts it. The body is of elongated shape, about $2\frac{1}{2}$ ft. in length, the tail somewhat tapering, compressed from above downwards, and serving as a rudder to guide the swimming movements of the animal. The legs are

short, muscular and mobile, each foot having five webbed toes. Lips, whiskered; ears, short; eyes, large. Under fur, short, closely set, woolly; outer covering composed of coarser, longer, dark-brown hairs.

The otter is chiefly nocturnal, swimming about at night in quest of food, and preys mainly on fishes, leaving many mangled after eating part of the victim, though largely subsisting on freshwater cray-fish, and destroying more eels—deadly enemies to trout streams or salmon rivers—than other fish. The burrow is constructed near the water's edge, and the nest situated at some distance in the bank of the river, being lined with grass and leaves, wherein from four to five young are produced in June. The otter inhabits Europe generally, and is a well-known denizen of Scotch and Welsh rivers and streams, also some English ones, being hunted for sport by means of dogs known as otter-hounds, which are specially bred and trained to the work. By diving, biting and hiding, with great tenacity of life, it often gives the hunters no little trouble to secure it. Although of an untamable and somewhat ferocious disposition, the otter can occasionally be domesticated to a very perfect extent, and trained to fish for the tamer.

BROWN RAT (*Mus decumanus*), Fig. 13, belongs to the family Muridæ or Mouse kind of the order Rodentia or gnawing animals. The lower incisors are narrow-pointed and smooth, two incisors, two pre-molars and four molar teeth exist in each jaw. Complete collar-bones exist, and the front limbs possess four toes and a rudimentary thumb, the hind legs having five toes. The tail is long, pointed and scaly and thinly haired.

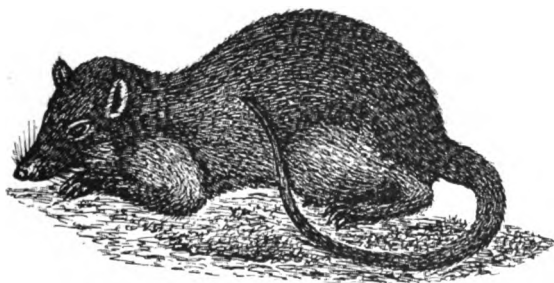


FIG. 13.—THE BROWN RAT.

The brown rat is known by its brownish fur, and was first noticed in England in 1730. It is much larger than the Black Rat (*Mus rattus*), the British native species, supposed to have come into Europe about 1200. The males greatly outnumber the females. They commence breeding at four months of age, and from three to four broods of from eight to fourteen young each may be annually

produced. Varieties of this species appear to exist, there being visible distinctions and differences between the barn and sewer rats. The habitats of the brown rat are cosmopolitan, in this country embracing hedgebanks, pond sides, corn and strawstacks, drains, barns, granaries, outhouses, warehouses, and dwellings. Its food consists of grain of all kinds, legumes, roots, vegetables, fruit—carrying it from stores, gnawing and spoiling great quantities, and the devastation committed in a house of ripe grapes is appalling. It also feeds on breadstuffs, fats, flesh—in fact, is a gourmand and scavenger. Its depredations upon poultry and pigeons are well known, also its feat in stealing eggs without breaking them. Barking vines and other ligneous plants is not uncommon work of the brown rat, as well as the wholesale cutting off of ferns in ferneries and plants in plant houses, while its gnawing of woodwork and tunnelling under floors and walls attest its further despoliation.

The true English or Black Rat (*Mus rattus*) is smaller than the brown rat, and possesses a blackish-grey fur. Although the black rat has been exterminated by the increase of the brown species, some observers incline to the belief that the scarcity of the former has arisen from the stronger males of the brown rat mating with the black females, and thus producing a brown progeny.

HOUSE MOUSE (*Mus musculus*), Fig. 14, is generally of a dusky brown colour, and its mouth, like the rat, is provided with organs



FIG. 14.—THE HOUSE MOUSE.

adapted for the mastication of a mixed dietary, or one not confined solely to vegetable matters. From six to ten young are produced in a litter, and brought forth several times in a year. In about a fortnight the young are able to shift for themselves, although they are born in a helpless condition. "Albino" or so-called "white mice" are not uncommon. They are whitish or yellowish-white in colour and possess pink eyes. A "piebald" variety is also bred from the house mouse, and, like the albino, is readily tamed and frequently kept as a pet.

The house mouse frequents dwellings, buildings, barns, granaries,

cornstacks and other places where foodstuffs are stored or used, and at times is very troublesome in gardens, unearthing peas and beans, also crocuses and other roots, and destroys young trees and vines by gnawing the bark round the stems just beneath or at the surface of the ground, and it is very fond of ripe fruit, particularly forced strawberries and late grapes. The chief food, however, of this animal consists of grain, seeds, roots, breadstuffs, lard, flesh, cheese, and, if opportunity offers, confectionery and even honey.

LONG-TAILED FIELD MOUSE (*Mus sylvaticus*), Fig. 15, is of a brown or chestnut colour, with a darker stripe along the middle of the back, whilst the body and tail is of a whitish colour beneath. It frequents woods, fields, nurseries and gardens, and feeds upon seeds, roots, conifer seeds, acorns, beech-mast, hazel nuts and other products of hedgerow and woodland shrubs and trees. It also turns up and devours seed-grain, peas and beans, "rot-heap" and seed-



FIG. 15.—THE LONG-TAILED FIELD MOUSE.

bed seeds, nibbles off buds of seedlings and "transplants," and sometimes the bark and wood of small trees in young plantations, peeling and nibbling the stems at a height of 1 to 3 feet, while damaging seed-beds by its burrowing.

The long-tailed field mouse has a particular penchant for barking trees in young plantations up to ten or twelve years of age, especially on warm sunny exposures with a tangled soil-covering of grass and weeds, beech, ash, maple, sycamore, and willow being most attractive, although in hard winters the animal will attack almost any young ligneous plant. Even in orchards young stems up to 2 inches in diameter may be gnawed round at from 1 to 3 feet above the soil. This is the more remarkable as the long-tailed field mouse lays up a store of food for the winter, an excavation being made in the ground and stored with such provisions as chestnuts, acorns, hazel nuts and seeds of various kinds, hence much of the damage done to young trees is often that of voles, not of the wood-mouse. It produces from four to six young twice or thrice in a year.

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The HARVEST MOUSE (*Mus minutus*), Fig. 16, is the smallest British mammal, and constructs a beautiful and elegant nest about the size of a cricket ball of the blades of grass or corn, entwined round and supported by the stalks of the corn or wheat.

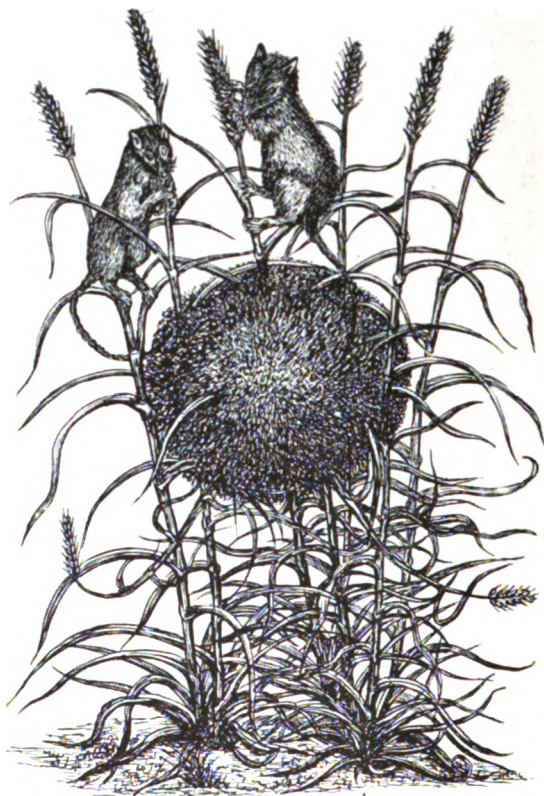


FIG. 16.—THE HARVEST MOUSE AND NEST.

The harvest mouse frequents grassy glades and fields, and its food consists of grain, various seeds, and vegetables, sometimes gnawing the young growths of trees in plantations. Like the long-tailed field mouse it hibernates during the winter, and lays up a store of provisions in its nest during the autumn.

WATER VOLE (*Arvicola amphibia*), Fig. 17, commonly called Water Rat, and often confounded with the brown rat, which frequents the same localities, is a native of Britain, inhabiting the banks of streams, ponds and lakes. It attains a length of 13 in. including the tail of about one-third of the measurement, which

is short when compared with that of the brown rat and mouse. The ears are very short and rounded, the soles of the feet hairless, and the head broad and blunt. Its colour is chestnut-brown, tinged with grey above, and fading into grey on the under parts. It breeds twice yearly, producing five or six young at a birth.

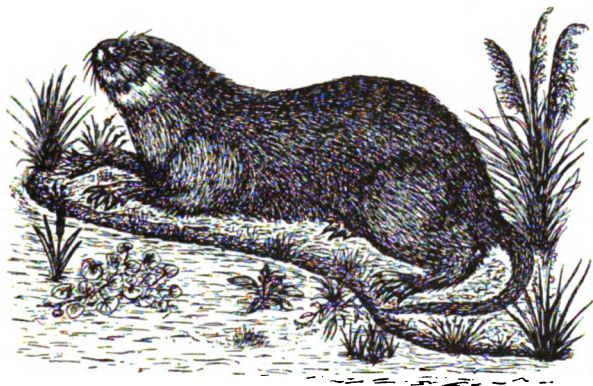


FIG. 17.—THE WATER VOLE.

The water vole damages embankments by tunnelling below the level of the water, and often strays to places away from streams, devastating potato and vegetable crops, and in woods injures young trees by biting through roots up to 2 or even 3 in. in diameter when forming its runs. It appears to have a partiality to poplar, willow and apple trees. Otherwise it feeds on aquatic plants, its food being almost, if not entirely, vegetable, the carnivorous propensities reported against it being very doubtful. A black variety is common in some localities, particularly in the north of England and north-east of Scotland.

FIELD VOLE (*Arvicola agrestis*), Fig. 18. This small animal, about 5 in. in length, is of a reddish-brown colour above and grey below, and found in woodland glades, grassy plantations, meadows (especially in hilly and moorland districts on "bog," strong marshy land, either grazed or mown for hay), parks, mown or un-grazed orchards, rough grassy parts of pleasure grounds, always where there exists a considerable depth of "bottom grass" or debris of gramineous vegetation. In this soft bottom the field vole makes runs, never burrowing deeply, and cuts the grass between the root and the blade, eating the tender white part just below the ground, and in bad cases so complete is the under-cutting that the whole surface is left with a coating of loose withered herbage readily skimmed off as "hay." Indeed, it is the close, dense, and often mossy bottoms of meadows and pastures, or other land with

a thick soil-covering of grass that gives the field vole advantage and protection—and food being abundant, also absence of rodent-devouring animals and bird—for multiplying, and as the females outnumber the males in the proportion of about 75 per cent., and as each female brings forth eight to ten young every six or eight weeks, and the young begin to breed when eight weeks old, the total progeny of one female may in the course of a breeding season from March to late in autumn, amount to thousands, say 10,000. Mild winters and dry spring and summer weather favour their increase, damp weather, heavy rainfall, and frost without snow tend to limit their prolificness.

From the breeding places the field voles move to “fresh fields



FIG. 18.—THE FIELD VOLE.

and pastures new,” invading dry hill pastures, heather-clad moorlands, and young plantations, also nurseries, everywhere destroying much, if not all, edible growth, meaning, in hill pastures and moorlands, impoverishment of stock, and in young plantations and nurseries serious devastation. In plantations they bark young trees, biting through ash, beech, hazel, willow, larch and Scots pine of two to five years' growth, while saplings of broad-leaved species are sometimes barked all round at a height of 6 to 10 in. above the soil when several years of age.

Though the field vole is ever present, it is only in certain periods that it assumes the nature of a plague, and these date from 1581, when Holinshed recorded the appearance of mice in the marshes of Danesey Hundred in Essex to such extent as to “sheare and gnaw the grass by the rootes, spoyling and tainting the same with their venomous teeth, in such sort that the cattel which grazed thereon were smitten with a murraine and died thereof; which vermine by policie of man could not be destroyed, till at last there flocked together such a number of owles as all the shire was not able to yield, whereby the marshholders were shortly delivered from the vexation of the said mice.” Similar visitations, according to Stowe, Childrey, Lilly, Anstice, Lord Glenbervie, Sir Walter Elliot, etc., occurred in various parts of England and Scotland in 1615, 1648,

1660, 1745, 1813, 1825, 1836, 1864-7, and 1875-6. In 1813-14, the New Forest in Hampshire suffered severely from the depredations of these voles, when the raptorial birds (such as owls, hawks, etc.), weasels, stoats, and many other carnivorous animals are assumed to have been more numerous than in 1876, when a plague of these animals (voles) visited farms on the borders of England and Scotland and committed much havoc, also again during 1891 and 1892.

RED FIELD VOLE (*Arvicola glareolus*), Fig. 19. This little rodent animal is notable for its broad blunt head, short ears almost hidden in fur, short legs and tail, and peculiar reddish brown of its coat. It inhabits woodland glades, hedgebanks (hence the name of bank vole or bank campagnol), meadows, rough grassy parts of parks and pleasure grounds, orchards and other places with a grassy and mossy bottom. Like the field vole, it makes shallow runs among the grass roots, and feeds largely upon the tender white parts of the grasses. In the thick soil-covering of grass it makes a nest of grass,



FIG. 19.—THE RED FIELD VOLE.

leaves and moss, breeding twice yearly and producing four to eight at a birth.

From the general feeding and breeding quarters, the red field vole makes incursions into gardens, causing serious havoc among bulbs, nibbling off ferns and other plants, biting tasty roots such as carrots, and cutting off the berries of strawberries and piling them in heaps before or after extracting the seeds. In nurseries the red field voles attack the terminal buds of young trees, especially Scots pine seedlings and "transplants" of 2 ft. or more height, and there and in plantations of young trees nibble off the bark just above the ground, singling for special attack, larch, pine and aspen, also dogwood and elder, carrying on the destructive work from November to March inclusive. At times they invade plant and fruit houses, and being excellent climbers, mount shelves and nibble off the berries of forced strawberries. But grass and seeds form the chief dietary of red field voles, even in winter when the

ground is covered with snow for weeks they work in the grass, shearing off the grassy and mossy soil-covering, so that after the snow has departed the fluff peels off as completely and leaves the soil as bare as similar ground skimmed with a turving spade. Like damage is done by the field vole when the ground is covered with snow for a lengthened period.

DORMOUSE (*Muscardinus avellanarius*), Fig. 20, a member of the Rodentia and family Myoxidæ, appears to be intermediate between the mice (*Muridæ*) and the squirrels (*Sciuridæ*), and there are three varieties, the Common, the Garden, and the Hazel, local in respective distribution, the two former being confined to the warmer tracts of southern and central England, and the latter more frequent throughout the northern tracts of Europe. The dormice live in copses and among brushwood, through which they

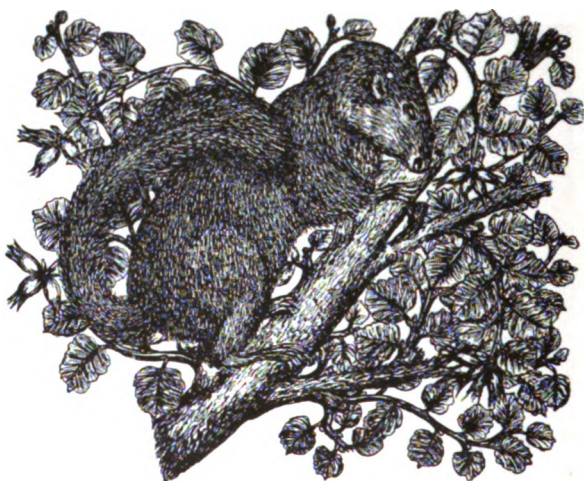


FIG. 20.—THE DORMOUSE.

make their way with much rapidity, but not with the sprightliness and activity of the squirrels. The pace is a sort of leap, in which assistance appears to be afforded by the tail. The nest is made of grass, moss and dried leaves, about 6 inches in diameter, and open only from above. The number of young is generally three or four. It is not uncommon for several nests to be close to each other, evincing its fondness of society.

Dormice feed during the night-time and hybernate during the winter, with few interruptions, only a warm day rousing them from their slumbers when rolled up with the tail coiled round the body. Before retiring for the winter into the hollows of trees or

prepared nests, they lay up a supply of food, such as nuts, acorns and berries. In the spring and early summer they nibble off the needles of young sprays of conifers, and peel the tender rind from young broad-leaved trees, such as alder, beech, birch and hazel, their attention being more confined to the broad-leaved species than to coniferous trees; and afterwards they feed upon fruits, hazel nuts, chestnuts, beech-mast, and acorns, with, perchance, grain. They are also credited with robbing the nests of certain insectivorous birds of their young broods.

The SQUIRREL (*Sciurus vulgaris*), Fig. 21, belongs to the order



FIG. 21.—THE SQUIRREL.

Rodentia and family Scuridæ, and is arboreal in habits, typical of frolicsomeness and sport, the bushy tail assisting in its aerial flights. The colour of the fur is usually a rich ruddy brown on the upper parts, this colour merging into reddish or greyish white on the under portion of the body. The nest and dwelling-place consists of a spherical structure formed of intertwined woody fibres, leaves and moss, and is generally placed in the fork of a bough, and in an

inaccessible situation so far as other animals are concerned. One pair generally occupy the same tree and nest for a lengthy period. From three to four young are produced at a birth, usually in June, the young remaining in the parent nest until the following spring.

The feeding propensities of squirrels are displayed in woods, parks, plantations and pleasure-grounds by their devouring the buds, chiefly flowering, of Scots pine, silver fir, and spruce trees, biting the young shoots of those trees not arrived at flowering-bud stage just below the terminal buds, and in the case of stiff-branched trees devouring the buds *in situ*. The squirrels prefer the male flower-buds to the female, consequently where these animals abound coniferous woods yield but small quantities of seed. In addition to devouring the flowering-buds of various trees owing to the large amount of protein which they contain, the squirrels evince delight of dainty morsels by biting off the bark in May, June and July of young broad-leaved trees of from fifteen to thirty years of age, the barking being usually performed in the crown, and most frequently in dry, hot seasons. Aspen, beech, hornbeam, horse-chestnut, and willow suffer most among the broad-leaved species, and among conifers, larch and pine. This dietary is varied with cockchafer grubs, pupæ of sawflies and other insects, but directly cob nuts and filberts are fairly kernelled, squirrels forget everything else, though occasionally having no scruples in respect of ripening apricots, nectarines, peaches and plums, carrying them off to feed upon in copses at leisure. Sweet chestnuts are dainties the squirrel loves, and stores in dry places purposely dug in the ground and carefully covered over with earth. Hazel-nuts and acorns are also stored in a similar way, likewise beechnuts, and for quality of preservation nothing can equal these earthpits. These stores are for use in late winter or when appetite prompts and weather permits. It not only devours large quantities of these on and off the trees, but feeds freely on the seeds of conifers, obtaining them by pulling the cones to pieces. Not content with its own storing, the squirrel scrapes up the germinating nuts or seeds sown in nurseries near its dwelling-places, and not least of its antics is guiltiness of attacking the young of useful species of birds, which, more effectively than itself, would otherwise help to keep down injurious insects.

CHAPTER II
WILD BIRDS
RESIDENT

INSECTIVOROUS AND HARMLESS.

THE KESTREL or WINDHOVER (*Falco tinnunculus*), Fig. 22, belongs to the Falconidæ. The colour is reddish brown to fawn, with black or bluish-black bars or spots on the back, and the breast of a lighter hue of fawn or chestnut. The beak of the male is blue. The nest is built in high trees, commonly in old nests of crows

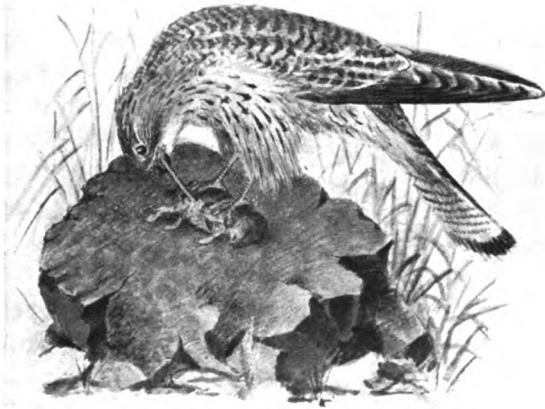


FIG. 22.—THE KESTREL AND FIELD VOLE.

or magpies, on high rocks or old towers; the female lays five eggs, about $1\frac{1}{2}$ in. long, mottled with reddish brown; the young birds appear about the beginning of May.

The kestrel is a beautiful and valuable bird, frequenting woods, groves, fields, parks, lowland and hill pastures, commons and moorlands, and may be identified by its habit of poising itself and hovering almost immovably over a certain spot, whence its popular name *wind-hover*. The food consists chiefly of field and red

field voles, beetles, especially cockchafers and wireworm (larvæ of click-beetles), and grasshoppers, and though charged with occasionally taking very young birds, the kestrel is perfectly innocuous to game and poultry, its food consisting almost exclusively of mice, grasshoppers, coleopterous insects and their larvæ.

The BARN OWL (*Strix flammea*), Fig. 23, is included in the family Strigidæ, which in itself represents the nocturnal section of the order of Raptores or birds of prey. Its length is about 14 in.,



FIG. 23.—THE WHITE OR BARN OWL WITH RAT (LOWER FIGURE), AND NIGHTJAR WITH MOTH (UPPER FIGURE).

with very long wings reaching below the tail. The legs are long and thin, covered with downy feathers and with long claws; there are no tufts on the head, which is light buff in colour. The underpart of the body is white, and of the back buff, with bars and spots of blackish grey. The inside of the wings is white, the back and exterior of the wings vary somewhat in colour in different specimens. The nest is of the most rudimentary description and made in hollow trees, holes in rocks, ruins or old buildings, barns and church steeples. The eggs are pure white and about $1\frac{1}{4}$ in. in length and laid towards the end of April in number from three to six. Sometimes eggs are laid after the first brood

of owlets has come forth and are hatched by the warmth of these young, so that owlets in various stages of growth may be found in the same nest.

The barn owl is found in all parts of the British Islands, though it is somewhat rare in the northern parts of Scotland, and frequents barns, pigeon-cots, stackyards, ruins, and hollow trees, the two latter being its chief haunts, and from its dwelling and nesting places scours the surrounding districts of field mice and rats, particularly young rats, its mousing proclivities being very pronounced, four species of mice having been found at the same time in one nest: the common house mouse, harvest mouse, long-tailed field mouse, and the short-tailed grass mouse (vole). It has been noted that forty mice have been brought to the nest of the barn owl in one hour. Mice and voles, with rats, varied with cockchafers, larger moths and other injurious insects form the chief dietary of the barn or white owl.

The COMMON CREEPER (*Certhia familiaris*), Fig. 24 (left hand), belonging to the family Certhidæ, or creeper kind, is remarkable for



FIG. 24.—THE COMMON CREEPER (LEFT HAND); NUTHATCH (UPPER); AND SPOTTED WOODPECKER (LOWER FIGURE).

its long slender bill and claws, adapted for climbing trees, and capturing insects. It may often be seen solitary or in pairs, running spirally up the trunks of trees, and probing the bark with its bill. It frequents woods, parks, pleasure grounds, copses and hedgerows, incessantly searching for insects, their eggs, larvæ, chrysalids or pupæ, on the trunks of trees, hence invaluable in woods, in fields and hedgerows, in parks, pleasure-grounds and fruit plantations. The nest of this elegant little bird is made in a decayed tree. The eggs are from seven to nine in number, grey, with dusky spots.

The COMMON WREN (*Troglodytes vulgaris*), Fig. 25, is one of the smallest of our resident British birds, and averages about 4 in. in length. Of solitary habits, it prys into crevices and holes, nooks



FIG. 25.—THE COMMON WREN AND NEST OF YOUNG.

and corners, where few other birds go, and is found in woods, copses, hedgerows, pleasure grounds and gardens, often scrutinizing fruit-tree walls, and not infrequently visiting glass structures. It is constantly in motion, searching for insects, which form its accustomed food.

The nest of the wren is built in any convenient cranny; an ivy-covered tree, the thatch of a barn or cottage, or a hedge bottom, and is usually of an oven-like shape, covered on the outside with

some material resembling the colour of the objects around it, such as green moss if built among ivy, or brown lichen if built on a rock or in the fork of a withered branch. The male sings sweetly in summer, pairing taking place about the middle of spring, nesting being effected in April; the eggs are six or eight in number, white, speckled with reddish brown. Two broods are produced annually. The colour of the birds is reddish brown, but white and pied varieties are sometimes seen.

The GOLDEN-CRESTED WREN (*Regulus auricapillus*), Fig. 26, known also as Golden-crested Regulus, or Kinglet, is a beautiful bird belonging to the family Sylviadæ, distinguished by an orange



FIG. 26.—THE GOLDEN-CRESTED WREN (RIGHT-HAND FIGURE), AND LONG-TAILED TITMOUSE (LEFT-HAND FIGURE).

crest. It is the smallest of British birds, being only about $3\frac{1}{2}$ in. in length. The most usual haunts of the golden-crested wren are tall trees, particularly the oak, the yew, and the various species of fir and pine. During the greater part of the year it haunts tall trees, prying closely about the trunks and branches of firs, in woods and plantations, but in autumn and winter it visits gardens, even in the suburbs of large towns, and is very fearless of observers, allowing of close approach while it is engaged in hunting for insects in the stems and branches of trees. In the noontide of a hot summer or autumn day the little golden-crested wren flits noiselessly from spray to spray, with unwearied activity, in search of its food, fluttering over the slenderest twigs like a butterfly, now on one side, now on the other, sometimes above the branch, sometimes beneath, hanging with its head downwards, often at the end of it, suspended in the air by its tiny wings, which it quivers without the slightest sound, and its chirp is so low as only to betray

its presence to quick ears, and more like that of an insect than a bird. In spring and summer it sings regularly, beginning about the middle of March, and continuing till the end of July.

The nest of the golden-crested wren is a very neat and elegant structure, usually placed on the underside of a fir-tree branch, sometimes open at the top, and at others covered with a dome, and has an opening on one side. The eggs are nine or ten in number, small round, and reddish-white in colour. In plumage, the golden-crested wren is a beautiful mixture of green and yellow, with white bars on the wings, and on its head the golden crest, bordered with black, from which it takes its name.

FIRE-CRESTED WREN (*Regulus ignicapillus*), a closely allied species to the golden-crested wren, is nearly 4 in. in length, and has a crest of a bright-red colour. It is of similar habits to the golden-crested wren, frequenting fir plantations and woods, also pleasure grounds and fruit plantations in autumn and winter, prying in thickets closely for food—eggs, larvæ, pupæ, and adult insects.

The **LONG-TAILED TITMOUSE** (*Parus caudatus* or *Acredula rosea*), Fig. 26, left-hand figure, is common in the south and south-western counties of England, but not so common in the north. It is about 4½ inches long, and usually builds a very elaborate nest, shaped like a bottle, in thick bushes or dense shrubs, and has a tiny hole in the upper part of the side. The eggs vary in number from ten to sixteen, very small and very delicately spotted. The head, breast, and neck of the long-tailed titmouse are whitish with black bands or stripes. The back is black, and the wings and very long tail are black, edged with white. In habits the long-tailed tits are gregarious, very active on trees in woods, pleasure grounds and fruit plantations, their food consisting of insects—their eggs, larvæ, chrysalis or pupæ, we having known them to clear a large plantation of black currant bushes of black aphides. The annual consumption of each of these birds has been estimated by Brocchi at nearly 200,000 insects in the form of eggs and larvæ, and remarks that when they attack the buds of fruit trees, an offence with which they are sometimes charged, it is certain that there are insects within these buds.

The **COLE TITMOUSE** (*Parus ater*) is rather more than 4 in. long, bluish-grey with a dull white breast, large white patch on the neck and white spots on the wings. It usually makes its nest in holes in trees and stumps of trees, but sometimes nests in banks, taking advantage of burrows or holes made by rabbits or other animals. In habits the cole-tits are semi-gregarious, frequenting fir or pine plantations and woods, and feeds upon insects—their young entirely fed with larvæ or caterpillars; and in winter they pry into every crevice and fold of the bark of bushes and trees in search of eggs, hibernating larvæ, pupæ, or perfect insects, even

the minute eggs of the *Bryobia* and *Tetranychus* or red spider upon the ivy and lime, or upon the stems and branches of sloes, bullaces, damson trees and gooseberry bushes, varying its diet with woodbine berries and thistle seeds. Of cole and other tits picking out the buds of trees and shrubs we have no experience, and where this does occur it is certain the buds swarm with larvæ of aphides, chermes, winter moth, apple-blossom weevil, and other pests according to species of insect infecting the various buds.

The MARSH TITMOUSE (*Parus palustris*) is not so common as the cole-tit, and though semi-gregarious and frequenting marshy ground, osier-beds, and groves near rivers, may occasionally be seen in orchards and gardens. It is slightly smaller than the cole-tit, head bluish-black, sides of neck white, upper part of body olive-brown of various shades, and under part light brown. It builds its nest similar to the cole-tit in holes in stumps of trees and in holes in the ground. It is insectivorous, feeding upon insects, their eggs, larvæ, and pupæ, and has been seen to feed the young twenty times in an hour with caterpillars. The adults are partial to the seeds of the thistle.

The CRESTED TITMOUSE (*Parus cristatus*) is notable for the crest of feathers borne on the head, and its rarity in Britain. The food consists of insects and weed seeds. The Bearded Titmouse (*Parus biarmicus*) inhabits the neighbourhood of rivers and lakes, feeding upon insects and Mollusca, also seeds of grasses and sedges. The "beard" is a tuft of black feathers depending from the sides of the head. It is comparatively rare in England.

The HEDGE ACCENTOR or HEDGE-SPARROW (*Accentor modularis*), Fig. 27, sometimes called the Hedge-warbler, belongs to the



FIG. 27.—THE HEDGE-SPARROW OR ACCENTOR.

family of the Sylviadæ, and is found over the British Islands. The length of the bird is rather more than $5\frac{1}{2}$ in., and the plumage, liable to vary in colour, is generally of a reddish brown, streaked with dark brown: the song of the male is short and plaintive, and, though sweet in tone, deficient in variety and power.

The habits of the hedge-sparrow are solitary. It frequents hedges, thickets and woods, its nest, built of green moss, roots, and wool, lined with hair, being finished early in March. The eggs, four or five in number, are of a delicate and spotless bluish-green colour, and the first brood of birds is hatched in April, and a second brood further on in the season. The cuckoo often places, not lays, her eggs in the second brood nest of the hedge-sparrow. The food consists of worms, insects, the young being entirely fed with caterpillars, and other larvæ, also small seeds, but not any cultivated fruit. In winter it visits homesteads and is very confiding, grateful for crumbs and other food scattered about dwellings. Alas! for its benign services, schoolboys rob the nest, and many adult birds are shot on "seed trails," or captured beneath baited, propped-up sieves pulled down by a string during severe weather.

The GOLDFINCH (*Carduelis elegans*), Fig. 28, included in the family



FIG. 28.—THE GOLDFINCH ON THISTLE.

Fringillidæ or Finch kind, and sub-family Fringillinæ, is the most esteemed of the hard-billed British birds, for the colour of its

plumage, the elegance of its form, and the harmony of its notes. The bill is white, tipped with black, and surrounded at the base with a ring of rich scarlet feathers. The head is covered with large spots of black and white, the back, rump and breast are of a pale, tawny brown. When the wings are folded they display a row of white spots, finely contrasting with the black ground on which they are placed, these are the tips of the wing-feathers, which terminate in white.

The goldfinch commences singing early in March and continues its song throughout the whole spring. It prefers orchards as a residence, and the nest is a beautiful structure, the outside being composed of moss, lichen and coarse grass, lined with hair, wool, and down from various plants. The female goldfinch lays five eggs of a whitish tint marked with spots of a deep purple colour at the larger end. The young are reared on small caterpillars and other insects of a soft nature. In autumn and winter goldfinches are gregarious and feed upon seeds of teasle, plantain, knapweed, groundsel, burdock, dandelion, and, above all, thistle (hence the name of thistledfinch) and grasses.

The GREAT SPOTTED WOODPECKER (*Picus major*), Fig. 24, lower figure, belongs to the Scansores or Climbers and the family Picidæ, sub-family Picinæ, distinguished by the bill being truncated at the tip, and the sides of the upper bill ridged. In this beneficent bird the bill is equal in height and breadth, and the nostrils are hidden by bristles. The tongue is exceedingly long, and capable of being protruded rapidly and to a very great length, while its sides and apex are armed with barbed horny filaments serving to impale the insect prey, and the salivary glands are largely developed, and secrete a glutinous substance, which aids the tongue in its work of capturing insects. The great spotted woodpecker is coloured black and white, with a scarlet crown. Various white spots are disposed on the black-ground, and the throat and under-parts are white. The female is red and crownless. The average length is 8 or 9 in. The nest consists of a hole in the trunk of a tree enlarged by the bill. The eggs are of white colour and number five. These birds are continually hopping about the trunks of trees and their branches, and appear to tap on the bark for the purpose of causing insects to emerge from their concealment, the stiff feathers of their tails assisting the birds to maintain their position on the trunks of trees. But the woodpeckers scruple not to peck off the outer bark of trees infested with bark-beetle larvæ, and in this way and other wholly insectivorous habits are extremely serviceable.

The LESSER WOODPECKER (*Picus minor*) is of similar habits to the Great Spotted Woodpecker, its haunts being large woods and parks and pleasure grounds.

The GREEN WOODPECKER (*Gecinus viridis*) is distinguished by the bill being keeled and curved, and its edges straight. The

plumage is of a general green colour, with scarlet on the top of the head, a black beak, and yellow on the tail coverts. It is far more common than the other woodpeckers, and may often be seen in woods, woodlands, and pleasure grounds, tapping on the bark of trees and even pecking off bark to feed on bark-beetle grubs. It also devours ants and ground insects.

The LAPWING or PEEWIT (*Vanellus cristatus* or *vulgaris*), Fig. 29, belongs to the Gallatores or Waders, and is included in the Pressirostral or compressed bills section of the order. The beak, crown of the head, and the tuft are black, the back and wing coverts are also black, tinged with purple and copper colour, the lower part of the breast and belly are white, and the claws are black. The wings are long and the flight powerful, whilst the legs are elon-



FIG. 29.—THE LAPWING OR PEEWIT.

gated, the toes slender and short and connected at their bases by a web, so that running and wading may be performed with equal facility. The nest is a mere hole or depression in the surface of the ground, either in grass or arable land, with a few bits of dried grass, bents or rushes at the bottom. The eggs are of a dirty olive colour spotted with black, and four are generally found in each nest. The young run about soon after they are hatched, and are carefully tended by the parent birds, who divert any one from the progeny by fluttering around him, even assuming disablement to distract and invite pursuit.

The lapwings or peewits are gregarious, but dispersing and pairing during the breeding season. They frequent marshy ground, meadows and fields, also moorland, and in severe weather the sea-beach. They feed in the evening and devour worms, slugs, wire-

worms, beetles, aphides, the larvæ of various insects that infest grass, cereals, root crops and other cultivated plants, and crustacea. On opening the crop of a lapwing that had been shot it was found to contain several wireworms, and it was calculated that this bird, when living, would devour a hundred wireworms in a day. For the services rendered to the grazier, farmer, and the cultivator of the soil generally, the eggs of the peewit are collected by the thousand to supply the great demand for them as luxuries of diet. This is all the more deplorable as the peewits are protected in close time throughout Great Britain by the Wild Birds' Protection Act of 1880, while the eggs are not protected by the adoption of the Wild Birds' Protection Act of 1894 in every county in England and Ireland as well as in a few counties in Scotland. Thus the natural increase of peewits is largely interfered with, quite apart from those killed for food, and the multiplication of pests injurious to crops is the consequence.

USEFUL AND PARTLY INJURIOUS

The NUTHATCH (*Sitta cæsia* or *europæa*), Fig. 24, upper figure, included in the Tenuirostres (slender billed) section of the order Insessors or Perchers, forms a sub-family Sittinæ, of the Certhidæ or Creepers. It averages about 5 in. in length, the body of robust make, bluish-grey in colour in the upper portion, and light reddish-yellow on the lower parts. The sides are brown, and the throat and cheeks white. A black streak passes from the base of the bill to the shoulders. The nest is constructed in the hole of a tree, sometimes in a former habitation of the woodpecker, and is lined with oak-leaves, in which the female lays six or seven eggs of a white colour spotted with brown. The birds defend their nest vigorously, abiding by it in face of persecution. Indeed, the nuthatch is fearless and assiduous in searching for prey in stems and branches of trees, often head foremost when descending trunks. They occur chiefly in pairs, agile and active. The female is not so brilliant or definite in her colours as the male. The food consists chiefly of insects and their larvæ. Nuts—cob, filbert, and hazel—also form part of the dietary, the bird, fixing the nuts in the crevices of trees, opens them by repeated strokes of its bill. Acorns and beech-mast are likewise appropriated. Nuthatches, generally in solitary pairs, may occasionally be seen in the neighbourhood of London.

The REDBREAST or ROBIN REDBREAST (*Erythacus rubecola*) belongs to the Dentirostral Insessors, and is included in the sub-family Erythacinæ or Robins, a sub-division of Sylviadæ, or Warblers. The red breast of the male is the distinguishing feature of these bold and confident birds, so well known for associating closely with mankind, especially in winter, the female having the breast

of a duller yellowish-brown colour. The nest is built in a crevice of an old ivied wall, a hedgebank and various other places, and is made of moss and leaves, and lined with feathers. The eggs are five or six, pale grey in colour, profusely marked with reddish spots. The food consists of worms, small slugs and other mollusca, particularly the eggs, also larvæ of ground insects, varied with fruit in season. It is very fond of currants and cherries, also grapes, often entering late vineries pecking and spoiling the berries. Indeed there is little of the "babes in the wood" tale instinct in the red-breast, its disposition being extremely pugnacious to its own members; but the bird's familiar habits with mankind, marked for selfishness, though its confidence, render it a general favourite.

The BLUE TITMOUSE (*Parus cæruleus*), Fig. 30, included in the



FIG. 30.—THE BLUE TITMOUSE.

Dentiostes section of inessorial birds and sub-family Parinæ, is about $4\frac{1}{2}$ in. in length. The wings and tail are blue, breast and belly sulphur-yellow, back yellowish-green, and side of the head white with a blue band running across it from the beak to the nape. In winter the blue-tits are semi-gregarious and generally distributed throughout Britain. Pairing in spring, the nest is made in holes in trees, walls, gateposts, pumps, and other singular places, of moss,

hair and feathers, and the female lays from eight to fourteen eggs, white marked with reddish-brown spots.

The parent pair of blue-tits have been observed to feed their nestlings with small caterpillars 470 times in one day, chiefly brought from apple and other fruit trees and bushes. Insects also enter largely into the dietary of the adult and fledged birds during the summer, and in winter feed upon seeds, eggs and pupæ of insects. During severe weather blue tits are bold and active, prying almost everywhere for food, scanning buds closely for aphid and moth eggs, and we have known them clear apple trees of mussel scale. They are also very fond of meat, also sunflower seeds, picking them out of the heads before fully matured. For thistle seeds the blue-tits have some partiality and for beech-nuts. They are also very destructive to ripening pears and apples by pecking them near the stalks, while sometimes they take green peas out of the pods.

The GREAT TITMOUSE (*Parus major*) is about 6 in. long, with its head and throat glossy black, and a white patch under each eye, back olive or ashy green, and body underneath greenish-yellow with a black, broad stripe down its entire length. It is solitary in habits, bold, but retiring, and not so common as the blue tit. The nest is made in holes in walls, trees, decayed posts, and similar places, and the young birds are reared by the parent birds generally on small caterpillars and grubs; but we have known a whole row of green peas cleared out of the pods by the parents of a nest of young birds in the hole of a wall near. The great tits, however, do not peck pears so much as the blue-tits, feeding largely upon insects and their larvæ. In winter time it feeds upon seeds as well as eggs of aphids and moths and other insects, and also hibernating pests, with pupæ, and though said to be destructive to buds of fruit-bushes and trees, this is not consonant with our experience. It is particularly fond of fat meat.

The MEADOW PIPIT (*Anthus pratensis*) belongs to the Dentirostral Perchers and is included in the sub-family of the Motacillinæ or Wagtails. The bill is of moderate length, and slender with the tip of the upper mandible notched and curved. The hinder claw is long, in which and the development of the tertiary quills it chiefly resembles the skylark, and in its similar plumage. The tail is elongated, and the length of the bird is 6 in. It resembles the wagtail in running swiftly on the ground, chasing insects, and vibrating its tail after the habit of that bird. Hilly grounds, commons, and meadows are its chief resorts in summer, but during September and October flocks of meadow pipits or titlarks may be seen congregated in stubbles and in turnip fields, and, like the skylarks, feed on any exposed or badly covered seed-corn. Its food, however, consists chiefly of insects. The nest of the titlark is made on the ground; eggs, five or six, light brown in colour, spotted with a darker tint.

The MISSEL or MISTLETOE THRUSH (*Turdus viscivorus*) is the largest of the British resident Turdinæ or true Thrushes, attaining a length of 11 in., and is reddish-brown on the upper parts and yellowish-white below, the under surface marked with jetty black spots of triangular form on the throat and neck and round on the chest and belly. The nest is made in a tree, and contains about five reddish spotted eggs, breeding beginning early in April. During this season it is very pugnacious, attacking and driving other birds of larger size, and at other times is said to persecute the song-thrush. Bold and wary in character, also of solitary habits, it certainly does not favour intruders, and though particularly fond of fruit, the missel-thrush seldom visits cultivated fruits, but feeds largely on wild fruits, such as mountain ash, holly, hawthorn, yew and other berries, in copses and woods, and, as its name implies, is very fond of the berries of the mistletoe. In comparison with the song-thrush it is relatively scarce. It feeds largely upon worms, snails, ground insects and larvæ of various above-ground pests.

The SONG-THRUSH, THROSTLE or MAVIS (*Turdus musicus*), Fig. 31, charms alike in town and country with its sweet song, its

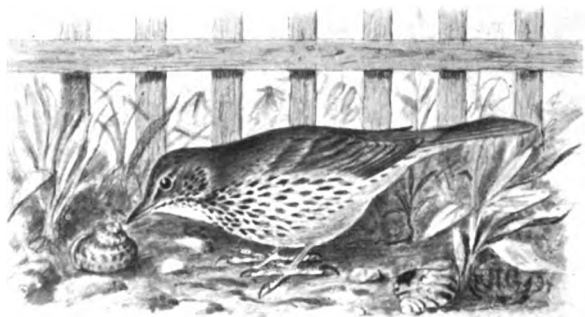


FIG. 31.—THE SONG-THRUSH AND SNAIL.

powerful notes being heard in November and December, at the new year when the weather is mild, and in early spring the groves ring with its joy. The colour is a brown of different shades on the upper parts, the chin white; belly and under tail coverts a greyish white. The throat, breast, and inner parts of the thighs are yellowish, spotted with dark brown. The average length is 9 in. The nest is made in hedges and thickets, bushes and trees, composed of roots and grass stalks with mosses, and plastered inside with mud. The eggs are bluish green, spotted with deep reddish-brown or black. Several broods are reared in a season.

The song-thrush is familiar to all within hearing of its song in town and country. It feeds upon worms and ground insects gener-

ally, and is very fond of snails, dexterously breaking the shells by hammering them against a stone, where often heaps of snail-shells may be found broken. The song-thrush also feeds upon fruit, wild and cultivated, and is particularly destructive to strawberries, currants, gooseberries, raspberries, and blackberries, and though fond of cherries, is not given to feasting so much on pears, plums and apples as the blackbird.

The BLACKBIRD (*Turdus merula*) belongs to the same family (Turdidæ) as the missel and song-thrush, all included in the sub-family Turdinæ, taking up its abode among plantations and copses near the habitations of man. The colour of the male bird is a uniform deep black, relieved only by the bright orange-yellow of the bill and circle round the eyes. The female has the bill and circle round the eyes blackish-brown, the throat yellowish-brown, and the under-parts rusty brown. The young birds resemble the females, and the males do not acquire the yellow bill till after the second moult. The song of the blackbird is a fine, rich, mellow, and flute-like strain, but is not so varied nor so continued as that of the song-thrush. It is heard for a considerable period of the year, as two or three broods are produced in a season. The nest is made early in spring in a thick hedgerow, a low close bush, an ivied tree or wall or even the side of a ditch. It is formed of fibrous roots, small sticks, grass stems and moss, bonded internally with a coating of mud and lined inside with fine dry grass. The eggs are generally four or five in number, of a bluish-green colour, profusely spotted with brown. The young are chiefly reared upon worms. The food of the blackbird consists of worms, mollusca (chiefly in the egg state as regards snails and slugs), ground insects and their larvæ, varied with wild fruits. It is particularly fond of strawberries and bush fruits, cherries, pears, plums, and sometimes apples, doing immense damage during dry weather when other food is difficult to obtain. Albinos, or white blackbirds with red eyes, are sometimes found.

The JAY (*Garrulus glandarius*), included in the Corvidæ or Crows as a sub-family named Garrulinæ, is of a light brown inclining to red colour, whilst the primary wing feathers are of a brilliant blue, marked out by bands of black. The forehead crest is composed of white feathers with black spots, and there are black patches below the eyes, whilst the quill feathers in the wing and tail are coloured jet black. No wonder, therefore, that the plumage of the jay is esteemed for "bird millinery." The nest of the jay is generally built on low trees or shrubs about 20 ft. from the ground, a thick bush being preferred. The eggs are five or six in number, yellowish-white and thickly speckled with brown. The jay is of a timid, restless habit, inhabiting woods, and feeds upon worms, snails, cockchafers and other insects—their larvæ and pupæ, and it is said mice, eggs, and young of feathered game. It also feeds

upon wild fruits, including acorns and beech-mast, and at times is very destructive to peas in gardens. Taken young, the jay is easily tamed, and is very amusing when domesticated, the bird possessing considerable talents for mimicry, frequently being taught to articulate words.

The MAGPIE (*Pica caudata* or *rustica*) belongs to the Conirostral or "conical-beaked" section of the perching birds, and is included in the family of the true crows (*Corvinæ*). It averages about 18 in. in length, weighing from 8 to 10 oz. The tail is elongated and thus distinguished from the ordinary crows. The beak, wings, and tail are black; the wings especially, and the tail also, being variegated with white, and with shades of blue, purple, and green. The magpies, like the jays, are semi-gregarious in all seasons but the breeding, which occurs in the spring, the pair of magpies building an oval nest in a thicket of high bushes or trees, and completely covered in by thorny twigs effectually protecting and concealing it, the entrance being on one side and the inside lined with mud, whilst the bottom is covered with a layer of soft grass and plant materials for safely containing the eggs and forming a comfortable home. The eggs are from five to seven in number, and are of a pale greenish colour, closely spotted with dark brown or black. The magpie inhabits woods and thickets, but is more disposed to scour the country than the jay, and feeds upon Crustacea, Mollusca, and insects, eggs and feeble young of other birds, and carrion. In rural districts the magpie is still regarded by some persons with a superstitious fear, and its talking habits, and thieving propensities under domestication render it disfavoured by many individuals. My father was an adept at domesticating jays, magpies, and jackdaws, teaching them to repeat words and even short sentences, a well-known trait of the magpie in the time of Plutarch, who, in classical times, gives an account of a talking magpie, which belonged to a barber in Rome.

The Rook (*Corvus frugilegus*), Fig. 32, included in the sub-family of the *Corvinæ* or true Crows of Conirostral Insessors, possesses its distinctive characters in the base of the bill being naked, as well as the forehead and upper part of the throat, which parts in the Crow are feathered, though in the young rook feathers exist at the base of the bill, but these disappear when the bird is a month old. The wings of the rook are long and somewhat rounded, so that it is capable of long flight and performing sundry evolutions in the air. Its colour is black with a bluish sheen, and the length of the bird is 19 in.

Rooks are gregarious, and in autumn and winter have particular roosting-places, where they congregate in vast numbers in a certain wood, and include the scattered broods for a considerable distance around. In the early spring or late winter they pair and repair, in part to new or former nesting-places, such as a grove of

trees near a house, or in a park, or by a church, and in small woods, frequently near the habitations of man. The nests are built on the tops of high trees, and are composed of sticks or twigs, lined inside with dead grass and other material, old nests being repaired. The eggs are five in number, and are bluish green, with dark spots or patches. The male and female sit alternately upon the eggs, and both attend to the rearing of the young birds. This occurs during the spring, usually April, when insect larvæ are equally voracious with the nestling rooks. Cockchafer grubs, wireworm, leather-jackets and other ground pests of crops, oak-leaf roller moth caterpillars, small ermine and other moth caterpillars, with



FIG. 32.—THE ROOK.

slugs and worms, form a major portion of the food of the young rooks and of their parents. But the rooks also feed upon newly sown grain, upon "set" potatoes, and are oftentimes a great plague to poultry and pheasant rearers, not only taking the food, but in some cases appropriating weakly young birds. For walnuts the rooks have a particular penchant, taking them off the trees wholesale, and they act similarly in regard to acorns, feeding also upon beech-mast, wild berries and various seeds.

The JACKDAW (*Corvus monedula*), included in the order Insectivores and family Corvinæ or true Crows, is distinguished by its comparatively short black bill, white eyes, head and neck of a grey colour, glossy black upper plumage, dusky colour of the under plumage, and by the black legs. The average length is about 12 in. The nest is built in towers, spires, and other elevated situations, and even in towns and populous cities breeding is carried on freely. The eggs are of a greenish colour, spar-

ingly spotted, and from five to six ; the female is exceedingly attentive to the young after they are hatched. The food of the jackdaw consists of worms, crustacea, and mollusca, varied, when opportunity offers, with fish, beetles and other insects, grubs and caterpillars, seeds and roots, after the manner of rooks, eggs, young birds, even of poultry and pheasants, as well as feeding on their food ; mice, killing them with a single blow and swallowing them head foremost, after the manner of terns and gulls ; and other garbage. Jackdaws are occasionally given to feeding upon cherries, and they, with rooks, sometimes do much damage in fruit plantations by settling on young bushes and breaking branches with their weight, especially gooseberries, and particularly where town manure is used, being attracted by the garbage. They, like rooks, are gregarious, the two associating in autumn, and like jays and magpies, readily tamed, being very amusing in captivity. One the writer had in juvenile days used to travel backwards and forwards from home to the fields with horse and cart, and, though not talkative, invariably perched on an apple tree and chattered incessantly while the church bells chimed for both morning and afternoon service, and on Sunday would not take journeys anywhere.

The STARLING (*Sturnus vulgaris*), Fig. 33, belongs to the Inses-



FIG. 33.—THE STARLING.

social birds of the Conirostral section and to the family Sturnidæ. The general colour is a dark or blackish green, tinted with purple hues and with metallic lustres. The shoulders are brown or buff, the wing coverts edged with pale brown, and the general plumage spotted with buff. The breast feathers are elongated and pointed, the beak is yellow. These characteristic colours are not

acquired until the second year. The first year's birds are coloured brown or brownish-grey. The females are less brilliantly coloured than the males. The nest is loosely constructed of sticks and straws, and generally made in a hole of a wall, or in a hollow tree. The eggs are pale blue, and five in number. Both parents tend the young, and the former and latter set up such an outcry when food is taken to the young that it may be heard a long way off.

Starlings are gregarious, common everywhere in large flocks, except in the breeding season, when they frequent buildings and especially churches, and are, to the district, guardians of lawns and meadows. The food consists of insects—cockchafers, wireworms, leather-jackets, woodlice, slugs (particularly their eggs), and worms, all the year round preying upon insects and their larvæ. The cherry is a favourite fruit of starlings, and, unless kept away, they will destroy the crop.

The GROSBEAK or HAWFINCH (*Coccothraustes vulgaris*), included in the family Fringillidæ or Finches, is noted for its conical and strong beak, which is fitted for the destruction of hard kernels. It is not a very rare bird, but on account of its shyness very seldom seen, venturing only from thick woods in quest of food. The nest is very shallow, and slightly put together, being little superior to that of the wood-pigeon. The eggs are from four to six in number, of a greenish-white, covered with dark marks and spots. The length of the hawfinch is 7 in. and very ornamental in plumage. Its food consists chiefly of seeds and berries, such as those of horn-beam, holly, bird cherry, laurel, and hawthorn, while at times it is very destructive to peas in gardens.

The CHAFFINCH (*Fringilla cælebs*), Fig. 34, a member, as the name implies, of the family Fringillidæ or Finches, is 6 or 7 in. in length in the male, the female rather smaller and altogether duller and less attractive in colouring than the male. The male is very handsome, bill bluish, black at tip, forehead black, sides of head dull pink, crown, nape and sides of neck bluish lead-colour, chin, throat and breast on its upper part dull pink, back chestnut-brown with greyish-yellow margins to the feathers, the greater wing coverts black at the base, broadly tipped with yellowish-white, forming a conspicuous bar, some of lesser wing coverts white, others tipped with white, forming another bar; first three quills black with white on their margins, the rest with their bases and part of their inner webs white, and with pale yellow margins on half the outer webs, tail slightly forked, two middle feathers lead colour, next ones black, and the outside one on each side with whole or part of the outer web white. The nest is formed in various situations: very often in a fruit tree in the orchard or garden, sometimes in a hedge, and even in a low bush, such as furze on a common. The very beautiful nest is usually covered outside with tree-moss and lichen, and inside lined with feathers, wool or hair, stalks

of grass, roots, etc., being woven into the other materials, thus securing a compactness of considerable strength. The eggs are four or five in number, of a dull bluish-green clouded with dull red, irregularly streaked and spotted with dark, dull, well-defined red markings. Two broods are hatched in the year. The young are chiefly reared upon aphides and various small caterpillars.



FIG. 34.—THE CHAFFINCH AND LEAF-ROLLING CATERPILLAR.

The chaffinch is very common in Britain, where its haunts are chiefly gardens and shrubberies, hedgerows, and plantations, in winter visiting farmsteads and even dwellings and stables, etc. The song of the chaffinch is lively and pleasant, but lacking variety, and its call-note has a cheerful sound. In the autumn the females separate from the males and remove to a different locality, hence the specific name of *calebs*. Thus gregarious in flocks of males, and in flocks of females and perhaps also their young, the chaffinches abide over winter, and in spring pair. The food consists of seeds, chiefly of weeds, such as charlock, chickweed, groundsel, plantain, etc., insects and their larvæ, the young being fed almost exclusively with soft insects. Chaffinches are also very fond of germinating seeds, plucking up seedling Brassicas in cotyledon

growth, radish and turnip suffering severely, also lettuce, salsify, and other Compositæ.

The COMMON LINNET (*Linota cannabina*), a plain but melodious member of the Finch family, is about $5\frac{1}{2}$ in. in length, of a dark reddish-brown colour on the upper parts, and a dirty reddish-white beneath. The nest is made in low bushes, the outside formed of dried grass, roots, and moss, lined with hair and wool. The eggs are four or five, of a pale blue colour, spotted with brown at the larger end, and breeding generally takes place twice in the year. The linnet frequents commons and pastures, often in large flocks in autumn and winter, and feeds on various kinds of seeds, being very partial to those of wild sorrel and other obnoxious weeds, and is captured in great numbers by call-birds and fall-nets for bird-fanciers, the song of the bird being sweet and varied, and its manners gentle and docile. The linnet occasionally plucks up Brassicas in seed-leaf, but this is rare.

The GREENFINCH (*Ligurinus* or *Coccothraustes chloris*) belongs to the sub-family Fringillinæ, and frequents gardens, shrubberies, hedges, plantations and fields. The general colour of the male on the upper parts is olive green, the primaries greyish-black, with bright yellow edges for two-thirds of their length, under-parts yellow. The female is of a hair-brown colour above, pale brown below. The male, which is a little larger than the female, is about 6 in. in length. Its song is not melodious. It breeds from about the end of April on to June, and builds its nest in hedges, bushes and low trees. The nest is mainly composed of green moss and coarse fibrous roots, and is lined with finer roots, horse-hair and feathers. The eggs are four to six in number, bluish-white, spotted at the larger end with purplish-grey and dark brown. The greenfinches are gregarious in habits, except in the breeding season, and feed upon grain, chiefly in stubbles, and seeds, such as charlock, dandelion, groundsel, chickweed, plantain, etc., and insects. The greenfinches are sometimes destructive to seedling Brassicas and other Cruciferæ, also Compositæ by plucking them up while in seed-leaf, and usually commit their depredations early in the morning. Though sometimes charged with destroying blossom-buds of fruit trees and bushes, this propensity has not come under our observation as regards greenfinches.

The SPARROW (*Passer domesticus*), Fig. 35, included in the Conirostral sub-family of the Fringillinæ or true Finches, is well known as the Common or House-sparrow. The average length of this species is 6 in., and they have the top of the head coloured of a slatey grey, the throat is black, and the latter colour passes over the eyes from the base of the head. The smaller wing coverts may be marked with white, the breast is greyish-brown, and the under-parts a dirty white, inclining to brown. Sometimes black, pied, brown, or even white varieties are seen. The nest

is placed in trees and shrubs, in holes in hayricks, thatch, walls and trees, in rainwater pipes, under the eaves of houses, in ivy-clad walls and trees, and, according to some observers, in the nests of the house marten and swallow. The nest is usually made of straw, hay or dried grasses, more or less in the form of an oval ball with an opening into it at the side, and is rarely found more than a mile from human dwellings. Five or six eggs are laid, of a bluish-white ground colour, variously blotched or speckled with brownish or blackish markings. Each pair of birds may rear two or three broods during the summer.



FIG. 35.—THE COMMON OR HOUSE-SPARROW AND YOUNG.

In habits no birds are more active or fearless than the common sparrows. They mingle freely with man, and frequent the busiest haunts of trade for the purpose of picking up food. The denizens of towns are generally of a dingier hue than those of the country. The food consists of grain, seeds, and general waste of food-stuffs in town and country, being in this respect a general scavenger, acting usefully by consuming weed-seeds in farmyards and elsewhere. House-sparrows also feed upon aphides, certain caterpillars, and other insects, fully 50 per cent. of the food on which the young are reared consisting of insect larvæ. In the garden sparrows eat the tops of pea-plants, winter spinach, and lettuce, pluck up "springing" onion, radish, turnip, beet (eating the leaves), and all the *Brassica* tribe seeds; destroy the blooms of crocus, primrose, polyanthus, and carnation (eating the tender "grass"), and demolish the buds of currant and gooseberry bushes, plum trees, and, some say, pear and apple trees. In allotments and fields the

sparrows, adults and young of the season, deserting the towns and villages scanty fare, including the poultry and pig-trough supplies, devastate wheat, barley and oat crops, commencing the onslaught as soon as the grain is fairly swelled in the ear, so that in the vicinity of towns the profitable cultivation of cereals becomes well-nigh impossible.

The TREE-SPARROW (*Passer montanus*) is a near relative of the house-sparrow, being included in the same genus. This is distinguished by the bill being broad at its base, and slightly scooped at its tip. The nostrils are partly concealed by the feathers, and the wings have their second and third quills longest. The tail is of moderate size. The tree-sparrow is known by its chestnut-coloured head, by the cheeks possessing a black patch of triangular shape, and by the belly being of a brownish-white colour. The neck may be encircled with a white streak, and the lower wing coverts are black. The average length is from $4\frac{1}{2}$ to $5\frac{1}{2}$ in. The nest is generally built in trees, the eggs being of a dull white colour, spotted with brown. The young appear to be chiefly fed with larvæ of insects, small caterpillars being most seen in the bills of the parents. The tree-sparrow is much rarer and more locally distributed than the house-sparrow, and not nearly so familiar.

The BUNTING (*Emberiza miliaris*) is included in the sub-family Emberizinae of the family Fringillidae or Finches, and its average length is 6 or 7 in. It is coloured dark brown above, each feather being darkest in the centre, the wing coverts being tinted yellow. The chin, throat, breast, and abdomen are greyish-brown mottled with darker brown. The nest is built of grasses, moss, and hair, and is constructed on, or near, the ground, and contains five eggs, greyish-white in colour, tinted with red or purple marks. The common bunting is found in spring and summer in cornfields, hence the name Corn Bunting sometimes given to this bird, that of Lark Bunting being also given to it from its colouration resembling that of the lark. Its food consists chiefly of seeds, especially those belonging to the various grasses; but it inflicts some damage on corn crops. Collecting in large flocks in autumn and winter, and being then fat and in good condition, the common buntings are in great request as delicacies for the table, and are caught in nets or shot.

The YELLOW-HAMMER (*Emberiza citrinella*) is distinguished, like the common bunting, by the sharp conical bill, the edges of the upper mandible being rounded and turned inwards and by having a knob on the palate. Its average length is about 7 in. The colour is yellow above, varied by dark-brown patches, the underparts being pure yellow, and the wing feathers dusky black, with brown or yellow edges, the flanks being of a brownish hue. The nest is usually made on a hedgebank or near the roots of bushes, and is composed of grasses, moss, roots, etc., lined with hair.

The eggs are of a pale, purplish-white colour, marked with streaks and dots of reddish-brown and five in number. The yellow-hammer or yellow bunting, shows great attachment to the young, each parent taking turn upon the nest. The food is similar to that of the common bunting. It frequents hedges and fields, and in winter, along with other members of the Finch family, visits farmsteads.

The FIELD or SKYLARK (*Alauda arvensis*), Fig. 36, is included in the family Fringillidæ and forms, with other species, the sub-family Alaudinæ, which is recognized by the straight, short, conical bill, and characterized by the great length and straightness of the claw of the hind toe. Of a light brown colour with darker markings and tinted white beneath, the skylark is familiar to every one in the country as thoroughly terrestrial in habits, running along



FIG. 36.—THE FIELD OR SKYLARK.

the ground, and soaring in the air pouring forth its melodious song. It begins to sing when it rises from the ground to commence its morning flight, the hour of three in the morning being the period when the lark generally ascends in summer. The notes, at first feeble and interrupted, swell out to their full tone as the songster ascends, and long after the bird has passed from the range of vision, the full notes of the melody are audible to the ear of the observer.

In early spring the skylark begins its song, which it continues throughout the summer and far into the autumn. The pairing time is during the month of April. The nest is constructed of grasses and lies on the ground, often in the print of a horse's foot, and most frequently under the shelter of a tuft of grass or earthy clod. The eggs are four or five in number, greenish white and spotted thickly with brown, the period of incubation being about a fortnight, and

two broods being produced in the year, one in May and the other in July or August. The young are reared chiefly upon insect larvæ including caterpillars. The food of the adults comprise worms, slugs, insects—their larvæ and pupæ, grass and other herbage, seeds and grain, chiefly in stubbles, and late or autumn sown corn not covered with earth. The larks are snared during the autumn and winter when they assemble in flocks for the purpose of feeding on stubble. The mode of catching the larks is generally by means of a number of horsehair noozes attached to a long line. Food, chiefly screenings, of winnowed corn, is scattered among the nooses, and the larks, in reaching the food, get their limbs entangled in the horsehair, and either strangle themselves, or are held until the fowler comes to take them out. Dunstable is the most celebrated place for them, as many as 4,000 dozen having been caught near that town alone in one year.

The WOODLARK (*Alauda arborea*) is smaller than the skylark and less distinct in its colours. It perches upon trees, and is chiefly found in fields near the borders of woods. Its flight is much less extensive and powerful than that of the skylark, and it sings during the night. The nest is built on the ground, generally under a sheltering bush. The eggs are five in number, of a dusky colour, spotted with deep brown spots. Two broods are reared annually. The woodlark is much less common than the skylark, its food being similar to that of the latter.

The BULLFINCH (*Pyrrhula vulgaris* or *europæa*), Fig. 37, belongs to the sub-family Pyrrhulinæ of the family Frigillidæ, and is noted for the beauty of its plumage and remarkable for the facility with which it is tamed and taught to "pipe," or even to articulate words. It has a short, rounded, robust bill, a black cap, and the plumage on the back is of an ash or dark blue-grey colour; the inferior parts of the body are reddish. The female is greyish-red beneath. In habits, the bullfinches are semi-gregarious, inhabiting coppices, thickets, and neglected hedges, pairing during the breeding season, and visiting gardens and fruit plantations. The nest is built in hedges and various low trees. The eggs are of a pale greenish-white, spotted with orange brown. The young are chiefly reared upon small caterpillars.

The Bullfinch feeds almost exclusively from February to April inclusive on the buds of various bushes and trees, in gardens and fruit plantations on buds of gooseberry and currant bushes, buds of plum, and occasionally pear and apple trees. Outside the garden and fruit plantation bullfinches feed on the buds of hawthorn, bird cherry, blackthorn and bullace, crab, larch, beech, etc. During the remainder of the year the bullfinch feeds on weed seeds, such as docks, thistles, hard heads, grasses, etc. Its attacks on fruit are limited to the raspberry, the seeds, no doubt, being the object; but this is not frequently practised. The bill, strong and thick,

of the bullfinch is well adapted for feeding on seeds and buds. The natural note of the bullfinch is low and can only be heard at a short distance, but when tamed and well-trained, the bird whistles, or "pipes," as it is called, any melody which has been taught it,



FIG. 37.—THE COCK (LOWER) AND HEN (UPPER) BULLFINCH ON DOCK.

in a fine flute-like tone. A good piping bullfinch sells at a high price, as much as £5 being demanded for a single bird.

The RINGDOVE or CUSHAT (*Columba palumbus*), Fig. 112, belongs to the family Columbidae or Doves, and is the largest British species, and has a wide distribution in Britain and Europe. A black ringlet round the neck, edged with white, gives it the name of Ringdove. In winter the ringdoves are gregarious, assembling in vast flocks in woods. They separate and pair in the spring, often

nesting in pleasure grounds and in trees in fields. The nest usually consists of a few sticks thrown loosely together on a flat sprayey branch, and is often so thin that the white eggs can be seen from below. Two broods are reared annually, and each of a pair of young. The "crop" of these birds is of large size and of double conformation, the so-called "pigeon's milk" consisting of the mucous secretion of the glands of the crop mixed with the softened food, which, being regurgitated from the crop, is used by the parents to feed their young. Both sexes incubate, and the young are entirely dependent upon the parents' care after being hatched, and pairing generally is for life. The food consists of grain, "seed" as well as ear and stubble, great variety of weed-seeds, such as charlock, wild mustard, etc., acorns, leaves and tops of swedes and turnips. It is also partial to leaves of "greens" (Brassica tribe) in fields and gardens, particularly recently planted cauliflower plants, and occasionally devastates pea crops.

The STOCKDOVE (*Columba ænas*), Fig. 112, is similar in its habits to the Ringdove, but more given to breeding in closer proximity in fir plantations, and feeds upon similar food, assembling in vast flocks in winter and feeding on beech-mast, etc., is often enticed to trains of grain in woods and shot in great numbers during severe weather. This species has been credited with being the progenitor of the domestic pigeon.

The ROCK PIGEON (*Columba livia*) builds in the holes and crevices of rocks, its food consisting of grains, seeds, and vegetables, varied with a dietary of mollusca, such as snails, etc.

DESTRUCTIVE TO GAME, POULTRY AND PIGEONS

The SPARROW-HAWK (*Accipiter nisus*), Fig. 38, a Raptorial bird and type of the sub-family Accipitrinæ, is one of the commonest of British hawks. The male is about 12 in. in length, while the female is 2½ to 4 in. longer. The upper part of the body of the male is of a bluish-slate colour, under-part brown or greyish-brown, with bars of darker colour. The female is brown in the body, and the under-parts light grey with brownish bars. In both the male and female the beak is blue and the legs and feet yellow. The wings are short, and the bird has a peculiar flight. High up in the air, propelled by its wings, it skims along for a while without their motion, but when in pursuit of prey it darts down with astounding velocity, even through trees and underwood, upon a wood-pigeon, sparrow or other bird, and swoops down on young partridges and pheasants, pigeons and chickens in the stackyard and poultry yard, fearless of man.

The sparrow-hawk builds a nest of sticks in trees, usually in oak or fir, and in the depth of woods. The eggs, rounded, bluish-green with shades or spots of brown, are five or six in number, and laid

at the beginning of May. When the young hawks are in the nest the parent birds hunt early and late, and at this time partridge, pheasant and poultry rearing is at its height and the toll taken by the sparrow-hawk renders the gamekeepers and poultry man's or woman's work unprofitable. At other times the sparrow-hawk hunts for food about dusk, when young partridges may be safe under the hen, young pheasants in their coops or under their foster-mothers, and chickens under similar protection be safe from attack; but even then no opportunity, under the pressing demands of hunger, is lost of swooping down upon small hares and rabbits, young partridges and pheasants, chickens and pigeons. Though termed



FIG. 38.—THE SPARROW-HAWK.

sparrow-hawk, it does not confine its attention to sparrows, but kills many kinds of small birds, such as chaffinches and other finches, blackbirds, thrushes, titmice, and wrens, hence injurious to some extent in that respect, and this counterbalances its beneficence in destroying wood-pigeons, which in some districts are a fearful pest to the farmer and gardener. The sparrow-hawk also feeds at times upon mice, grasshoppers, cockchafers, and even frogs. Not infrequently this bird is mobbed by smaller birds such as swallows, and even then a victim is seized and taken off in triumph. The sparrow-hawk is sometimes tamed and kept in gardens for the purpose of frightening birds; but it usually attracts them to mob it than they to be driven away.

The HEN HARRIER (*Circus æruginosus*) included in the sub-family

Circinæ of Raptorial birds, is remarkable for the peculiar feathered disc round the eyes, somewhat resembling that of owls. It lives principally about forests and heaths. Its food consists of hares, rabbits, feathered game, especially grouse, pigeons, birds, and reptiles.

The GYRFALCON (*Falco gyrfalco*) feeding, chiefly on ptarmigans, hares, and water-fowl, has been shot in the British Islands. The PEREGRINE FALCON (*Falco peregrinus*) chiefly inhabits wild districts, and nestles among rocks. It preys on grouse, partridges, ptarmigans, pigeons, rabbits, etc. The MERLIN (*Falco æsalon*) a beautiful and remarkably swift and spirited little falcon, about 1 ft. long and weighing about 6 oz., frequents moors, and constructs its nest in rocky places or in a bush, even heather. The eggs, four in number, are reddish, mottled brown. It feeds chiefly upon small birds, and young game birds fall a prey to it. The GOSHAWK (*Falco palumbarius*) is rare in Britain, and feeds upon hares, squirrels, pheasants and other large birds. The KITE (*Milvus regalis*) and the BUZZARD (*Buteo vulgaris*) are too rare to call for special remark in this connection. Indeed, all the species enumerated in this paragraph are so detested for their havoc in the poultry yard and amongst game as to receive no quarter from the poultry rearer and game preserver, hence rare in the British Islands.

The LONG-EARED OWL (*Asio asus* or *Otus vulgaris*), belonging to the Otinæ or Owlets, possesses nearly complete feathered discs around the eyes, and two small feathered tufts on the upper part of the head. It resides in hollow trees in parks, woods, and fields. Sallying forth at night it, mostly at dusk or dawn, preys on young hares, and rabbits, young game-birds and chickens, rats, mice, moles and small birds.

The TAWNY or BROWN OWL (*Syrnium aluco* or *Uluda stridula*) represents the Hooting Owls, without tufts, and inhabits hollow trees in parks, woods and fields, or old buildings. Nocturnal in habits and hooting, this bird is regarded by some persons with superstitious dread. Its colour is ashen-grey variegated with brown on the upper parts, and whitish-grey with various tints of brown on the under-parts, while the facial discs are nearly white, adding to the awe inspired. It nests in holes of trees, and in general it frequents well-wooded districts and the depths of woods and forests. It is a very bold bird, especially when it has young, and has been known to kill and devour young magpies in spite of the resistance of the old birds. Its food is very varied, young hares and rabbits, birds, mice, insects, and even fish forming part of its dietary.

The CARRION CROW (*Corvus corone*) is very similar to the raven (*Corvus corax*)—which is practically extinct in Britain—in appearance and habits, though it is much smaller, its length being about 18 in. The plumage is glossy blue-black, with some greenish reflections; the female is similar to the male, but rather smaller.

The carrion crow is generally seen solitary or in pairs, though the whole family remain together for some time after the young brood are able to fly. At night a company of ten or twelve often roost together, and bands of a like number are frequently seen in the winter time. The nest is placed on the summit of a tall tree, and solitary or remote from other birds, the foundation consisting of sticks and made of considerable size, the inside lined with withered grass, hair of cows and horses, and wool. The eggs, four to six in number, are bluish-green with blotches of brown. The food comprises carrion of all kinds, young hares and rabbits, eggs and young of game and poultry. It thrusts its bill through eggs and carries them off, and attacks young lambs and sickly sheep on moorlands, punching out the eyes of its victims. It does not disdain frogs, lizards, and insects, and goes to the sea shore betimes in order to feed on mollusca, crabs, shrimps and fish.

The HOODED, GREY-BACKED or ROYSTON CROW (*Corvus cornix*), Fig. 39, is common in Scotland and Ireland, but less so in England, though sometimes common in the northern counties during the winter. It leaves this country about April, yet some remain during the summer and bring up a brood of young.

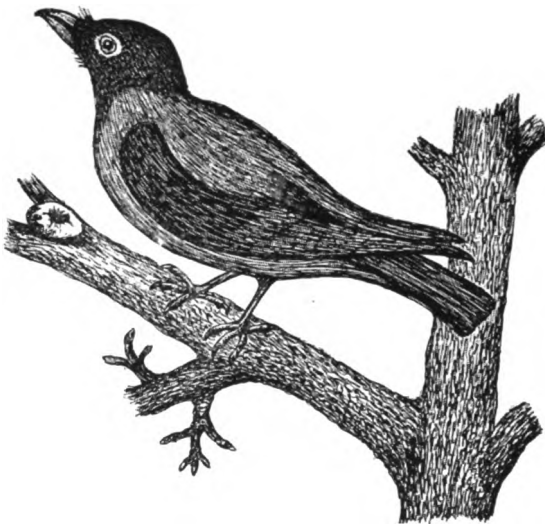


FIG. 39.—THE HOODED CROW.

The hooded crow is about 20 in. long. Its head, wings, and tail are black, the rest of the body is a dull smoke-grey. Its nest is similar to that of the carrion crow, and is built on the tops of very high trees, such as the pine, but it is also known to build on

precipitous rocks. Its food consists principally of carrion and garbage of all kinds, eggs, young birds—those of grouse and other species which it destroys in the north being very great—while in some parts of the Highlands ground is robbed of seed-corn and seed potatoes by the hooded crow. It also prowls about the preserves, warrens and pastures, where any weakly or disabled animal is either pecked to death or its eyes punched out, left to die, the crows ultimately feasting on the carrion.

AQUATIC OR WATER BIRDS

RESIDENT

INSECTIVOROUS AND HARMLESS

The PIED WAGTAIL (*Motacilla lugubris*), Fig. 40, a member of the sub-family Motacillinae of Dentirostral Insectivores and included in the family Sylviadae or Warblers, is notable for its well-known habit of jerking its tail when running or perching. The male is rather more than 7 in. in length, the female slightly over 6 in. from beak to tip of tail. The body is black above, breast, belly, and parts under the tail white. White feathers margin the wings and tail, while the legs and beak are black. In summer the throat is black, but becomes white in winter.



FIG. 40.—THE PIED WAGTAIL.

The pied wagtail inhabits meadow-lands and pastures, and is fond of frequenting ponds, streams and rivers, marshes and flooded meadows. It delights in pastures and fields where cattle and sheep are grazing, and appears in close friendship with them and quickly dispatches tormenting flies, etc., roused by the feet of the animals. The nest of a pied wagtail is built in banks,

in crevices among stones, or in the hole of a tree or wall, and always near the water. It is constructed of moss, dried grass, bents, and fine roots, and lined with wool, feathers and other soft materials. The eggs, usually four or five, are bluish-white, with brownish or purple-brown specks. Breeding begins in the spring, and there are often two broods in a season. The food consists of beetles, flies, moths, millipedes, woodlice, snails and slugs, the young being fed with aphides, small caterpillars, and other "soft" insects. The wagtails also scour shallow water of fresh-water molluscs, such as *Limnæa truncatula* and *Limnæa pereger*, known as hosts of the liver fluke (*Distoma hepaticum*), the scourge of the sheep farmer's flocks, and even wade into water after a caddis worm, the plague of water-cress beds, and other grubs. In autumn the pied wagtails move from the more northern to the southern parts of the kingdom, and some evidently pass to warmer climes, yet some remain throughout the winter in this country.

The DIPPER (*Cinclus aquaticus*), included in a sub-family (Formicarinæ) of the thrushes (Turdidæ), is about 7 in. in length, having a very short tail, rather small rounded wings, and large powerful feet, and bill of moderate length, straight and slender. In the male the upper parts of the body are brown, throat and breast white, belly rusty, bill dark, and the feet horn colour. The female's body is ashy brown above, the breast less white, and there is a yellowish tinge on the lower parts. The dipper frequents hilly places where there are clear and rapid streams, and is met with all over Europe. It dives and moves some distance under water, and effects its progress by grasping submerged stones, thus walking, not merely swimming or flying under water. The nest is usually built by the waterside and is a mossy bundle with a central cavity and an entrance at the side, often concealed in clefts of rock. The eggs are five or six in number, and pure white. In the northern parts of Britain the young are hatched in April. Its food consists of insects and larvæ, such as those of the dragon-fly, which is destructive of spawn, and newly-hatched fish, and therefore is of service to the angler. Besides, the song of the bird is a sweet lively note, and is retained throughout the year. To rapid, rocky streams the dipper is a great ornament.

PARTLY USEFUL AND PARTLY INJURIOUS

The KINGFISHER (*Alcedo ispida*), a member of the Fissirostral birds (Insessors), and type of the family Alcedinidæ, is included in the sub-family Alcedininæ. It is distinguished by the elongated stoutly formed, tetragonal bill, broad at the base, and terminating in an acute point, with its edges crenately-fimbriate, its length being disproportionate to that of the body, which, including the bill, is 7 in. The upper part of the head, the sides of the neck, and

coverts of the wings are green, spotted with blue. The back is dark green, lower back and rump bright blue. Throat, white; and under-parts of the body a pale brown colour. The kingfisher frequents the banks of rivers and streams, and usually solitary, perching on the bough of a tree, stump or stone overhanging the water. From this vantage position it dives into the water, secures its prey with its feet, carries it to land, where it kills and swallows the fish entire, the scales and other indigestible parts being afterwards rejected in the form of round balls or masses. The nest is generally found in the banks of rivers, or in other situations near the water's edge, and in holes where the birds disgorge the indigestible portions of their food. On this the eggs are deposited and the female incubates there. The eggs are from four to seven in number, remarkably round, and of pearly whiteness. The food of the kingfisher consists mainly of fish, but it also feeds largely on mollusca, crustacea, leeches, and water insects, the birds, as beautiful as rare, sometimes breeding in the bank of a small stream where no fish live or are found within a considerable distance.

The HERON (*Ardea cinerea*), included in the family Ardeidæ (Heron) and sub-family Ardeinæ, is about 3 ft. 2 in. in length, the body being exceedingly small, weighing scarcely more than 3½ lbs. It is distinguished by having a long bill cleft beneath the eyes, a compressed body, long slender legs, and the wings moderate. The tail is short, rounded and consists of twelve feathers. The plumage, of an ashen colour, is not attractive, but the plumes of the heron were formerly considered as ornaments only to be worn by the noble, and in former times the heron was carefully preserved on account of the excellent sport which it afforded in hawking. The flesh of the young heron was formerly a dish in high repute. Herons are dull birds and are often seen either perched on trees near the water, or wading in search of food. They are very expert fishers, and take their prey either by wading after it where the water is shallow, or by diving from the air when the object of their pursuit appears near the surface of the water. In times of frost and scarcity herons can exist for a long time with a very scanty supply of food, but in favourable weather they gorge themselves with insatiable voracity. They digest an enormous load of food in a short time, and again return to their feeding with new vigour and appetite. It has been asserted that a single heron will destroy 15,000 carp in half a year. Though the heron is commonly seen solitary away from the nesting-place, called heronry, the birds pair and build in high trees, sometimes sociably after the manner of rooks. The nest is a flat mass of sticks, and contains five bluish-green eggs. The young differ from the adult in not obtaining their full plumage until the third year. Besides fish, the heron feeds upon lizards, frogs, snakes, toads, rats, mice, water-voles, beetles and other insects.

The CURLEW (*Numenius arquata*), belonging to the Grallatores or Waders and family Limicolæ, is characterized by the bill being wholly or partially covered with a soft sensitive skin, thus enabling the bird to obtain its food from mud with facility, though unable to discover it by sight. The plumage is generally dull, greyish-brown, rosy white and blackish, in both sexes. In Scotland the curlew is called the "whaup," its length is about 2 ft. The whimbrel (*Numenius phæopus*) is very similar in appearance and habits, only rather smaller, being about 17 in. long. Both species are very shy, wary and vigilant of the approach of man. They are monogamous, nesting on tufts or tussocks in marshes or on moors. The eggs are usually four, pyriform, greenish-olive blotched with brown. Both parents incubate, and the young as soon as hatched leave the nest to seek their own food. The food consists of worms, small fishes, insects and mollusca. The curlews are good food. Uniting in large flocks in winter on the muddy shores of the sea and their flight being high, rapid, and protracted, they cannot easily be approached within gun-shot. They utter a loud, whistling note, easily recognized when once heard.

The WATER-HEN (*Gallinula chloropus*), Fig. 41, right-hand figure, belongs to the family Rallidæ or Rails, and sub-family Gallinulinæ.



FIG. 41.—THE LITTLE GREBE OR DABCHICK (LEFT HAND), AND WATER-HEN (RIGHT HAND).

It is rather common along the reedy banks of rivers and ponds. It is a good swimmer, though not web-footed, but has the toes furnished with a narrow membrane; it also dives with great skill and rapidity. The upper plumage is deep olive-brown, under blackish-grey. It runs on land with considerable activity, constantly flirting up its tail, so as to show the white feathers beneath.

The nest of the water-hen is built among sedges and reeds at the waterside, though we have known the nest made on a low bush by an ornamental lake, and contains from five to eight or nine eggs, of a creamy-yellow spotted with dark brown. The young when hatched look like round tufts of black down, and have conspicuous orange-coloured bills. They swim and dive well, albeit they sometimes fall a prey to the pike. The water-hen feeds upon worms, slugs, small mollusca, beetles, grasshoppers, and other insects, seeds, grasses, and water-cresses, hence not tolerated in water-cress beds.

The COOR (*Fulica atra*), of the same natural order as the water-hen, is of a dark slate colour, but the frontal plate is white, and there is also a narrow strip of white across the wings. The nest is usually at or near the water's edge, consisting of a huge mass of flags, reeds and grass, and is sometimes located in the water, being supported by sedges, etc. The eggs, from eight to fifteen in number, are of a greyish-brown colour with spots of a darker brown. The young when hatched are covered with a thick down, and they take to the water very soon. In the breeding season coots are found in pairs, but in winter these birds assemble in great numbers on the banks of rivers, lakes and in marshes. As they see very well during the night, it is then they seek for food, and sometimes may be seen flying from one pond to another. The food consists of worms, slugs, small mollusca, grasshoppers and aquatic insects, seeds, grasses, and watercress, with, some say, fish.

The LITTLE GREBE or DABCHICK (*Podiceps fluvialilis* or *minor*), Fig 41, left hand, included in the family Colymbidæ or Divers and sub-family Podicepinæ, has the head, back of the neck and upper surface of the body very dark brown, almost black; cheeks, sides, and upper front part of the neck reddish chestnut; under-surface dull greyish white. Its length is $9\frac{1}{2}$ in. It frequents rushy or reedy lakes or streams, and in winter resorts to the mouth of rivers and bays. It builds a large flat nest of aquatic plants, and lays four to six white eggs, which soon become stained with greenish-yellow and brown. The food consists of small fishes, water-insects, shrimps, fish-fry, and vegetable substance.

The CRESTED GREBE (*Podiceps cristatus*) is found in some of the fens of England and also inhabits parts of Scotland and Ireland. It is less common in England than the little grebe. The length of the bird is 21 to 22 in., and the crest feathers and top of the head are dark brown; cheeks, white; ear-tufts, reddish-chestnut, becoming dark chestnut at the ends. The skin of this grebe is made into muffs and trimmings for ladies' dress. The nest is built of decayed water plants almost level with the water, and is generally wet. The eggs are white and usually four in number. The old birds in case of danger take their young under their wings and dive below the water. The food of the crested grebe is similar to that

of the lesser grebe, both of which cover up the eggs, like the water-hen, when leaving the nest.

The COMMON GULL (*Larus canus*), Fig. 42, included in the family Laridæ and sub-family Larinæ or Gulls, is common on the coasts of the British Islands. It is distinguished by the straight bill, by the light body supported by large wings, by slender legs, palmated feet, and a small hind toe. It breeds in great numbers on the rocky coasts, or inland in moory districts. Its nest is composed of grass, rushes and other materials, and contains three or four eggs, of an olive-green marked with very dark brown.



FIG. 42.—THE COMMON GULL.

The gulls are exceedingly voracious, fighting with each other for prey. They keep much on the wing, and, though swimming well, do not dive, but snatch up their prey when at or near the surface. They are patient of hunger, but will feed upon every kind of animal food, either dead or alive, putrid or fresh. Their principal food, however, is fish, but they also feed on mollusca, crustacea, etc. Inland, the gulls, visiting the fields in autumn, winter, and spring to some distance from the coast, feed upon worms, frogs, mice (bolting them head foremost), cockchafer grubs, wireworms, beetles and other insects with their larvæ and pupæ. During the winter gulls frequent the estuaries of rivers, sometimes visiting shipping centres, such as London, and in presence of food abide until mild weather in early spring. Gulls are easily tamed, and always display the same quarrelsome and voracious habits as on

their native coasts. The other gulls are of similar habits to the common gull, but particular note may be made of the

BLACK-HEADED GULL (*Larus ridibundus*), Fig. 120, as affecting the farming and fisheries in the north of England, particularly Cumberland, where its food consists of vegetable and animal matter considered neutral in nature. "Of 100 birds examined 40 contained food which would lead the bird to be classed as 'harmful,' e.g. fishes, cereals, useful insects; 47 contained 'beneficial' food, e.g. injurious insects and mollusca, carrion, and waste animal matter; and 82 contained 'neutral' food, e.g., earthworms, crustacea, and spiders, harmless insects and mollusca, and vegetable matter other than cereals" (*The Journal of the Board of Agriculture*, Vol. XIV., No. 7, p. 111). Earthworms appear the staple food of the black-headed gull in inland districts, though wireworms, leather-jackets, common slugs, beetles and flies—injurious, harmless, and beneficial—are taken indiscriminately. Fish is sparingly eaten, partly from want of opportunity, as the black-headed gull does not readily obtain fish from water more than a few inches in depth, and partly from the greater ease with which other food can be procured at most seasons of the year. But gulls, like most other creatures, acquire new habits under abnormal increase, and then become injurious to the farming and fishing interests. Worms and other invertebrate animal food may suffice under no shortage of supply, but directly there is a deficiency of this class of food the gulls become addicted to the taking of grain (oats) and other vegetable produce, and to capturing and eating fish.

CHAPTER III

MIGRATORY BIRDS

INSECTIVOROUS AND HARMLESS

THE NIGHTJAR or GOATSUCKER (*Caprimulgus europæus*), Fig. 23, upper figure, included in the Fissirostral (Split-bill) section of the Insectores, family Caprimulgidæ and sub-family Caprimulginae, gains its appellation from the shrill whirring sound which it produces. The name of Goatsucker is derived from the superstitious notion that it sucks goats. It arrives in Britain at the beginning of May and leaves in September or later. It may be seen, on the approach of evening, silently wheeling round the trees, capturing the nocturnal moths and beetles and gnats. When flying the mouth is continually open, and the interior is covered with a glutinous substance, and this with the bristles placed along each side of the upper mandible prevents any insect secured from escaping without shutting it. The flying with the mouth open occasions the whirring noise made while chasing prey, and is low or loud according to the velocity with which the bird moves. When perched, usually lengthwise on a bare twig, it utters a jarring note. It is solitary in its habits and generally seen alone. The colours of the plumage are black, white, brown, grey, and ferruginous, disposed in the forms of bars, spots and streaks, which have a beautiful effect, the male having an oval white spot near the end of the three first quill feathers. Its length is about $10\frac{1}{2}$ in. The Goatsuckers frequent moors and wild heathy tracts, especially where ferns abound. They make no nest, but the female deposits two or three eggs on the bare ground, which are of a dull white spotted with brown.

The COMMON SWIFT (*Cypselus apus*) is generally included in the family of Insectorial birds. Hirundinidæ or Swallows, of which it is made to form one of the sub-family Cypselinae, but by some naturalists is considered more closely allied to the Goatsuckers. Its colour is a sombre or sooty black, a whitish patch appearing beneath the chin. The beak is black, and the "gape" or opening of the mouth exceedingly wide. It flies abroad chiefly in the morning and evening hours, and is readily distinguished by the peculiar swift, shooting flight, and shrill cry. It arrives in this

country in May and departs about the end of August. The nest is built in steeples and other elevated situations, and is composed of grass, straws, feathers, etc. The eggs, numbering two to five, are of a white colour. A single brood only is produced each year, and is hatched about the end of June or beginning of July. The food consists wholly of insects captured on the wing.

The COMMON or CHIMNEY SWALLOW (*Hirundo rustica*), Fig. 43, belongs to the family Hirundinidæ of the Fissirostral (cleft-beaked) birds, and sub-family Hirundininae. Its throat and forehead is chestnut-coloured or reddish brown, body of a bluish hue, wings and tail brownish, bill black, feet brown, or brownish-black, under the wings and belly inclining to buff.



FIG. 43.—THE COMMON SWALLOW.

The bird arrives in this country about the middle of April and takes its departure towards the end of September or the beginning of October. It breeds twice in the summer, building a nest of mud against a wall under the eaves of a dwelling, or other convenient situation, mixed with bits of straw or dried grass and hair, and is lined with fine grass and feathers. The eggs, usually four or five, are white, speckled with brown or dark red spots. The young of the first brood generally fly towards the end of June, and the second

at the end of August. The food consists exclusively of insects such as flies, gnats (including Daddy-Longlegs), winged aphides, small moths, and beetles on the wing, some beetles and other insects on the ground. According to a calculation made by a keen observer, one bird captures 5,000 insects per day and consumes 765,000 in the course of the summer. It is said that the house-sparrow drives away the swallow from its nesting-place, but, though well authenticated as occurring in some localities, has not come to our notice in either town or country districts, yet places where swallows have been accustomed to build are not infrequently occupied by sparrows, they acting on the good old plan of "take who have the power and keep who can"—the whole law of nature.

The HOUSE MARTIN (*Chelidon* or *Cotile urbica*) is of smaller size than the Common Swallow, which is rather more than 8 in., that of the former being about 5 in. in length. It arrives in this country about the middle of April and departs by the middle of October. The head and upper parts are coloured deep blue, the wings and tail are black, and the upper tail coverts pure white, as also are the under-parts. It builds its nest under the eaves of houses, in the corners of windows, etc.: hemispherical, formed of mud and lined inside with feathers, with a round opening for entrance. It lays five eggs, pinkish-white with an almost imperceptible dotting of red. About September immense numbers may be seen perched upon houses and trees preparatory to their departure; the food consists wholly of flies, gnats, and other insects.

The SAND MARTIN (*Cotile riparia*) is the smallest of British swallows, and usually is the first to arrive in Britain. It frequently builds in sandpits or gravel pits with sand layers, boring holes three feet or more in depth, and often winding in their course. Where a convenient sand-bank or cliff exists, hundreds of these little birds may be seen either working at their habitations or dashing about in the air. The eggs are five, pinkish white with an almost imperceptible spotting of red. The food is entirely insectivorous, chiefly flies and gnats.

The GRASSHOPPER WARBLER (*Calamodyta locustella*), a member of the Dentirostral (tooth-billed) Inessores, family Lusiniæ (nightingale kind) and sub-family Luscininæ, is of a greenish-brown colour, the upper parts being pale brown. Its length is about 5½ in. It keeps so close to a hedge that it is difficult to catch a glimpse of it, but the incessant cry, closely resembling a grasshopper, reveals its whereabouts. The nest is carefully concealed, and composed of dried grass, etc. The eggs are from five to seven in number, white speckled with red. The food consists of insects. It arrives in Britain in April and departs in September.

The SEDGE WARBLER (*Calamodyta phragmitis*) dives into reeds and grasses when disturbed. Its colour is brown above and white on the throat, the abdomen being of a buff colour. It frequents

river-sides, osier-beds, etc. The average length is $4\frac{1}{2}$ in. The eggs number four or five, yellowish-brown, with darker brown spots. The food consists of insects. It arrives in this country in April and leaves it in September.

The NIGHTINGALE (*Daulias* or *Luscinia philomela*), a celebrated song-bird, included in the Luscininæ or Sylviniæ (true warblers), is of a rusty brown colour on the upper parts tinged with olive, paler ash colour on the under-parts, blending into white at the throat and belly. Its length is about 6 in. It frequents trees and bushes of small size and subsists chiefly upon insects. The nest is of rough construction, generally formed of leaves and grasses, and mostly made in the neighbourhood of water. The eggs number from four to five, and are of an olive-green colour. The nightingale arrives in this country about the beginning or middle of April, the males before the females; the song continues until the middle of June, when the young are hatched. The male sings while the female is incubating during the day and at night also; the flood of song poured forth in the stillness of the evening forms the bird's chief reputation. In its distribution the nightingale is restricted to the south-western parts of England, being seldom heard in the western districts or in Wales, not at all in Ireland, and in Scotland almost unknown, its northern limits being at or near York. In places where its song is rarely heard, the interest of the local dwellers is so pronounced that much damage is done to meadow grass and other crops by bird-song lovers. The nightingale leaves Britain in September, and appears solitary in habits.

The CHIFF CHAFF (*Phylloscopus rufus* or *Sylvia rufo*) belongs to the Sylviniæ or True Warblers, sometimes also called Luscininæ. It is a small species, attaining a length of 4 or 5 in. Its colour is brown on the upper parts and white on the under. It arrives in England in March and departs in October. It inhabits woods and thickets. The nest is placed near the ground in a bush or resting on a hedgebank, and is rounded or oval and entered by a hole at the side. The eggs are six in number, speckled with purplish-red on a white ground. It destroys large numbers of insect larvæ, feeding largely on the leaf-rolling caterpillars, especially those of the cak-green moth.

The WILLOW WARBLER or WILLOW WREN (*Phylloscopus* or *Sylvia trochilus*), Fig. 44, is olive-green above, throat and chest white, with a yellowish tinge, while the belly is pure white. Its average length is 5 in. It is the first of Sylviniæ or True Warblers to arrive in Britain during March. It frequents woods and thickets, pleasure grounds and gardens, and is active and busy from "morn till eve" in searching for and devouring insects; meanwhile enlivening the groves with song.

The nest of the willow warbler is made in a low bush, oval or roundish in its form, and is entered by a little hole at the side. The

eggs are five to seven in number, grey-white in colour, spotted with red. The young are fed with aphides and small



FIG. 44.—THE WILLOW WARBLER OR WILLOW WREN.

caterpillars, the fledgelings and parents devouring countless numbers of insect pests. The willow wrens leave Britain in October.

The COMMON WHITE-THROAT or NETTLE CREEPER (*Sylvia cinerea*), included in the Sylviadæ or Warblers, averages $5\frac{1}{2}$ in. in length, and is reddish-brown in colour on the upper parts, white on the throat, and brownish white below. It arrives in England about the end of April, the males arriving first. It frequents the garden and shrubbery, hedgerows, copses and woods, enlivening the parts visited with its powerful and sweet song. The nest is built in open bushes, small, and mostly among brambles, or on a stump covered with overgrowth. The eggs, four or five, are of a greyish colour and thickly spotted with brown. The food consists of flies, caterpillars, and other insects, the young being fed on "soft" larvæ, chiefly caterpillars. In September the common white-throat takes its departure from Britain.

The LESSER WHITE-THROAT or BRAKE WARBLER (*Sylvia* or *Curruca undata*) is about 5 in. in length, dark grey in colour above, and the under-surface white, with a pinkish tint. It arrives in England towards the end of April, frequenting coppices, shrubberies and gardens, prying and searching everywhere and constantly for food, which

consists of insects, chiefly small caterpillars. The nest is built amongst brushwood; eggs, four or five, green with white, speckled with brown spots. The young are fed with "soft" larvæ, chiefly small caterpillars. The lesser white-throat leaves the British Islands in September.

The WHEAT-EAR (*Saxicola ænanihe*) belongs to the family Erythacinæ or Robins, and averages about $6\frac{1}{2}$ in. in length. Its colour is grey above, the quill feathers of the wings being tipped with black, and a black streak encloses the eye and ear-coverts; the breast is brown and the under-parts white. The female is coloured dark-brown on the wings, ear-coverts and tail. It arrives in this country in March and departs southward in winter. It builds its nest among stones, sometimes in burial places, or in rock-clefts, where, well concealed from prying eyes, the eggs, four to six in number and pale blue, are laid. It feeds chiefly upon ground pests, and the bird is much sought after for table, its flesh being very delicate. It is usually caught in nooses of horsehair concealed under a turf.

The WHIN-CHAT (*Pratincola rubetra*), included in the family Erythacinæ or Robins, is closely allied to the Stone-chat (*Pratincola* or *Saxicola rubicola*), and, like it, prefers the neighbourhood of furze or whin-bushes, but, unlike it, is a migratory bird, arriving in Britain in the middle or end of April. The upper parts of the body are coloured brown, with a white streak passing across the sides of the head; tail, white and brown at tip; chin, white, and throat fawn; the belly buff. The average length is $4\frac{1}{2}$ in. It produces two broods in the year. The nest is constructed on the ground, and the eggs are four to six in number, of a bluish-green hue spotted with brown. The first brood is hatched about the end of May. It feeds on the worms and insects which it procures in the neighbourhood of furze-bushes. The whin-chat, like the wheat-ear, is greatly esteemed for the delicacy of its flesh in the autumn.

The REDSTART (*Ruticilla phænicura*) derives its name from the red colour of the tail, and from the jerking motion which it exhibits when changing position. It is of the Robin family. The male has the upper surface of a bluish-grey colour and the tail red, the female uniform greyish-brown. The Redstarts arrive in Britain early in May and frequent localities near streams, visiting orchards and taking prey on semi-wing. The Redstart builds in the ivy of ruined buildings and trees, a hole in a wall or tree, the eggs, numbering five or six, being of a greenish-blue colour. It feeds upon insects, the young being fed with "soft" and small caterpillars. It departs from British shores late in August or early in September.

The GREY WAGTAIL (*Motacilla melanope*) is not such an abundant species as the Pied Wagtail, and is found chiefly in the hilly and mountainous districts of England and Scotland, and is fairly common in Ireland. It frequents streams and other places where there is water, and is of relatively solitary habits. It is not quite so large

as the Pied Wagtail. It is slate-grey above, the wing coverts, quill feathers and six central feathers of the tail being black, the throat is black, and the under-surface bright yellow. The nest is built early in spring in a bank, much like that of the Pied Wagtail, and usually contains five eggs, or sometimes seven may be found, of a creamy-white colour, speckled with light brown blotches. Frequenting brooks and other watercourses, also ponds and marshes it destroys numbers of fresh-water molluscs, such as *Limnæa truncatula* and *L. pereger*, well-known hosts of the liver-fluke (*Distoma hepatica*), subsisting entirely upon insects. The grey wagtails migrate southward in the autumn, and though some may remain in Devon and other southern counties of England, they generally leave the British shores in the autumn.

The YELLOW WAGTAIL (*Motacilla Rayi*) arrives in England in March or April and is generally distributed over England and southern districts of Scotland, but in the northern parts of that country and in Ireland the Yellow Wagtail is rarely seen. It is mainly of a yellow colour; upper parts olive or greenish-yellow, and lower parts of a canary or light yellow. The female is not so bright in colour as the male. The bill and feet are black. It is about $6\frac{1}{2}$ in. in length. On arrival in this country the Yellow Wagtails frequent marshes and grass-land, but soon pair and go to cultivated land, hunting for insects, even following the plough, and devouring millipedes, wireworms, and other insects as they are disturbed or turned up. Breeding begins early. The nest, usually made on the ground in grass or tufts or on a bank, is composed of dried bents and roots, with dried grass and wool or hair, or even fine roots, for a lining. Four to six eggs are laid, varying in colour from pinkish-brown to a darker brown. Two broods are sometimes produced in a season. After young are hatched, the birds move off to meadows, pastures and marshes, where they follow cattle and sheep for the insects around them. Found near watercourses, ponds, and marshy places they devour fresh-water molluscs, amongst them snail-hosts of the liver-fluke. The Yellow Wagtails leave Britain in September and October.

The WHITE WAGTAIL (*Motacilla alba*), regarded as a mere variety of the Pied Wagtail, is only an occasional visitant to this country. The BLUE-HEADED WAGTAIL (*Motacilla flava*) is even more rare in Great Britain.

The TREE PIPIT or TITLARK (*Anthus trivialis* or *arboreus*), Fig. 45, belongs to the Dentirostral Perchers and is included in the sub-family of the Motacillinae or Wagtails, which it closely resembles in its habits of running swiftly on the ground. The bill is of moderate length and slender, with the tip of the upper mandible notched and curved. The wings are long and pointed, the tertiary feathers being of great length. The tail is also elongated. It has a shorter curved hinder claw than the Meadow Pipit, though even this bears

some resemblance to the hinder claw of the true (*Conirostral*) Larks. The general colour tends towards brown or grey, spotted with darker tints.

The Tree Pipit arrives in this country in the spring and takes its departure in the autumn. It frequents woods and coppices,



FIG. 45.—THE TREE PIPIT OR TITLARK AND YOUNG.

building a nest on the ground, generally concealed by a tuft of grass ; the eggs, usually five or six, are light brown in colour, spotted with a darker tint. The young are chiefly fed with caterpillars, and the general food of the adult and fledged birds consists of worms, slugs, and insects, which they chase with much activity after the manner of wagtails, even vibrating their tails like them. The length of the bird is about 6 in.

The SPOTTED FLYCATCHER (*Muscicapa grisola* or *atricapilla*), Fig. 46, belongs to the family Muscicapidæ (Flycatcher kind) and sub-family Muscicapinæ, arrives in England during May, rarely in April, and is fairly common in England and some parts of Ireland, but not so frequently seen in Scotland. It frequents gardens, orchards, plantations and woods, and the banks of streams, where it may be seen either taking a short flight in search of insects, or perched on a rail, gate, bridge, or branch, making frequent swoops at passing flies, and returning to its vantage place. At times it half jumps, half flutters, from its perch, and seizes flies, gnats and other insects within easy reach, taking most kinds, including aphides, beetles, butterflies, moths, and sawflies.

The Spotted Flycatcher is about 5½ in. in length, chestnut-brown on the head and back, wings and tail darker brown, breast

and under-parts greyish-white to greyish-brown, and the bill and legs are dark brown in colour. The female is slightly smaller than the male. The nest is made in a hole in a tree or wall, or in the fork of a tree, on beams in outhouses, in fruit trees nailed to walls, or ledges of rock, and on stumps of trees. It is constructed of stems of grass, horsehair, moss, lichens, feathers and wool. The eggs, usually five in number, are pale green or bluish-white, mottled with



FIG. 46.—THE SPOTTED FLYCATCHER.

rust-coloured streaks. The parent birds feed the young almost incessantly with insects, sometimes bringing only one, and at other times two, three, four, five, or even more flies of different sizes at a visit, and have been known to bring food to the nestlings 537 times during the course of a day. The Spotted Flycatcher departs from the British shores about the middle of September.

The RED-BACKED SHRIKE (*Lanius collurio* or *collaris*), a Dentirostral Insectorial bird of the family Lanidæ (Butcher birds) and sub-family Laninæ, arrives in Great Britain at the end of April or beginning of May, and takes flight therefrom in September. The male has the head, neck and shoulders grey, a black mark crossing the eye from the base of the bill; back and wing coverts of a chestnut hue, passing into reddish-grey at the tail; under-surface of the chin, white, and under-parts of body tinted reddish; beak black. The length of the bird is 6 to 7 in. The Red-backed Shrike frequents coppices and hedgerows, flitting about, usually in pairs, the tops of bushes or low trees, the male impaling insects on the thorns of hedges to save the female trouble of capturing them. The nest is built on the top of a hedge or in a low tree, and is of large size, being composed of roots and grass, lined with hair. The eggs are five, white, tinted with blue, green, and sometimes red. The food

of the Red-backed Shrikes consists of mice, beetles, particularly cockchafers, grasshoppers, dragon-flies, and other insects, also young of birds.

The GREAT GREY SHRIKE (*Lanius excubitor*) occasionally appears in this country during the winter. The length is from 9 to 10 in. It feeds upon mice, frogs, and insects. The shrikes take their prey much after the same manner as the flycatchers, by darting upon it from some place of concealment.

The SISKIN (*Chrysomitris* or *Fringilla spinus*), included in the Fringillidæ or Finches, is hardly to be considered more than a migratory bird, as for the most part the Siskin fly to Norway and Sweden in summer, and pair there, returning to Britain in winter. Some, however, breed in the high parts of Aberdeenshire, nesting near the extremities of the branches of tall fir-trees, or near the summit of the tree. The nest is constructed of moss, grasses, feathers, and similar material. The eggs, three to five, are a bluish-white, spotted with purplish-red. The colour of the adult bird is a general green, each feather in the back being dark green in its centre, while yellow hues tint the neck, breast, and behind the ear, the quills of the wings and tail being black in the middle, sometimes shading into olive, the belly and under-tail coverts being white. The average length of the bird is 5 to 5½ in. The Siskins are usually seen in small flocks, and are active and lively in their movements, climbing among the twigs and boughs of trees, usually hunting osier-beds, wooded margins of streams, and coverts. Their food consists of the seeds of rushes and grasses, alder and birch mast, broom, elderberries, thistle, dandelion, chickweed, groundsel and other weed seeds. Birdcatchers seek much after these birds, as when interbred with the canary a hybrid progeny with a sweet mellow song is produced.

The REDPOLE (*Linota linaria* or *rufescens*), included in the sub-family of the Fringillinæ or True Finches, visits this country in September, and remains to pass the winter, leaving for the north of Europe in April, for the breeding season. This bird is taken in large numbers in the autumn season by the birdcatchers. It is the smallest of the British species of finches, the bill being short and conical and the wings slender and pointed, and though of a sombre colour, brown with darker marking, has a bright red pole on top of the head. The Redpoles frequent waste places and fields in flocks or gregariously, and feed upon small seeds, being very partial to wild sorrel and other obnoxious weeds. The song is sweet, but of weak character. The redpole will pair with the linnet, goldfinch and canary. The nest is built in low bushes or trees, the eggs being four or five, and of a pale bluish-green colour, spotted with orange-brown.

The WRYNECK (*Yunx torquilla*), allied to the Pieidæ or Woodpeckers, is characterized by its short, straight, and sharp-pointed

bill, nostrils partly hidden by a membrane, pointed wings, tail rounded, and its feathers soft and downy, tarsi scaled and partly covered with feathers, and two front toes united at their base. It derives its familiar designation of wryneck from its habit of twisting its head in a curious manner. It appears with or just before the cuckoo, arriving in Britain in April, and hence popularly named the "Cuckoo's Mate." The colour is a mixture of shades of brown and grey, and the average length is 7 in., the female being slightly smaller. It is tolerably common in the southern counties of England, but is very seldom, if ever, seen in the north and west. The nest is formed in the holes of trees; the eggs, six to ten, laid on the bare wood, are pure white. The tongue is long, like that of the woodpeckers, and the food consists of insects, chiefly ants, and pests infesting stems and branches of trees. It departs from Britain in August or September.

The Cuckoo (*Cuculus canorus*), Fig. 47, belongs to the family Cuculidæ (Cuckoo kind) and sub-family Cuculinæ. It is characterized

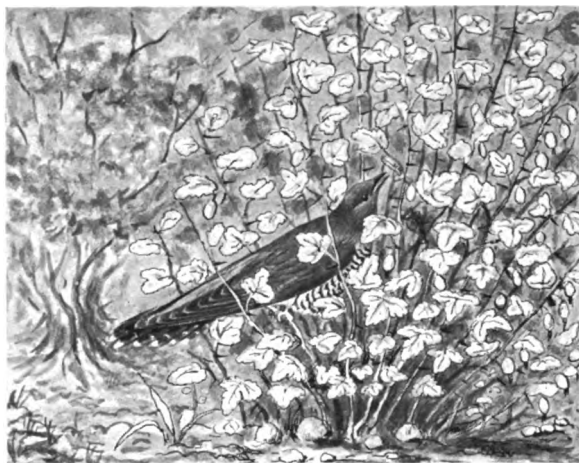


FIG. 47.—THE CUCKOO AND GOOSEBERRY CATERPILLAR.

by a bill of moderate size, short tarsi, and tail composed of ten feathers, bill compressed and slightly arched. The plumage is not attractive, the colour being shades of slatey-grey and brown with darker markings, white spots on the tail feathers, the under-parts whitish with brown markings. It arrives in this country during the last fortnight of April, and the male arriving first pours forth from a bare bough its monotonous song—cuckoo !

The Cuckoo is especially distinguished by the habit of the female in placing her eggs solitary in the nests of birds, always much smaller

than itself, such as that of the Hedge-sparrow, Meadow-pipit or Titlark and Tree-pipit. The eggs of the Cuckoo are extremely small, varying in weight from 43 to 55 grains, and the colour is extremely variable. Some, both in ground and pencilling, very much resemble the house-sparrow's; some are distinctly covered with bran-coloured spots, and others are marked with lines of black. The egg is laid on the ground and, taken in the mouth, placed by the cuckoo in the nest of the foster-parent, usually the hedge-sparrow's, incubation not taking place before the middle of May. A fortnight is taken up by the sitting bird in hatching the egg, and soon afterwards the nest is found to contain only the young cuckoo, which continues therein (or rather on) for three weeks, and if disturbed at the latter part of that time sets up its feathers, such as they are, after the manner of a peacock and makes a sort of hissing in order to disconcert the intruder. When the foster-parent appears with a caterpillar the young cuckoo opens its mouth wide, displaying its red throat and fluttering its feathers in joy for the repast. After leaving the nest the young cuckoo loiters about the place of its incubation and is fed by the foster-parents for a month or more, and then, full feathered, provides for itself, anon taking its departure, and after the old cuckoos, never acquiring the cuckoo note before departing, but utters a sort of screech now and again in its flight. The parent cuckoos feed entirely upon insects, taking many larvæ, such as wire-worms and leather-jackets from the ground on their first arrival, caterpillars not being sufficiently ample for their dietary; but when these, especially the hairy caterpillars, are abundant, they feed almost exclusively upon them, and are particularly fond of those infesting gooseberry-bushes, the cuckoos visiting gardens and clearing the bushes of the leaf-devouring pests. The old cuckoos, about 14 in. in length, depart from Britain early in July, though possibly some, "cuckoo-noteless," remain to pilot the young cuckoos over the "silver streak."

The COMMON SANDPIPER (*Tringoides* or *Tringa hypoleuca*), sometimes called the Summer Snipe, included in the family Scolopacidae or Snipes and sub-family Tringinae or Totaninae, is about 7½ in. in length, and has the head, back of the neck, back, upper tail coverts and centre of the tail greenish-brown mottled with black. A dark stripe runs from the base of the bill to the eye, and a strip of light colour passes over the eye. The plumage generally is marked with white, thus prevailing on the chin and under-parts of the body, and the tail has greenish-black markings. It arrives in England in April or May and leaves in September or October. The food consists of worms, small molluscs, and insects obtained from the mud on the banks of rivers. The nest is built in a hole in a bank near fresh water and where shaded by a tuft of grass or sedge. The eggs are four in number, of a reddish-white colour, spotted with brown, the young being able to follow the

parents and to seek food for themselves immediately after hatching out.

The WOODCOCK (*Scolopax rusticola*), Fig. 121, belonging to the sub-family of Scolopacinae or Snipes, is about 14 in. long, and weighs from 13 to 15 oz. It is of a brown colour of various shades, darkest on the back, the tail black, tipped with grey above. The Woodcock arrives in England in October, and leaves again in March or April. It frequents woods and thickets where there are water-courses, visiting swamps in order to find the worms and larvæ of insects, which it obtains by thrusting the bill into the earth.

The SNIPE (*Gallinago cælestis*), included in the sub-family Scolopacinae, is to some extent migratory, being found in Britain chiefly in winter. It inhabits marshy districts and fens, and is found generally throughout Britain by small streams and even ditches in both hilly districts or moorlands and in flat localities. The average length of the bird is about 10 in. The general colour is shades of brown, variously streaked and marked, the under-parts being white. It nests in Britain, though not very commonly, the nest being formed of leaves on the ground and under a tuft of grass or small furze bush. The eggs, numbering four, are olive-white, spotted with brown. The food consists of worms, snails, woodlice, and insects, chiefly in larval state. When pursued the Snipe usually takes flight in a zigzag fashion, and thus renders it difficult to take a steady aim.

The GREAT SNIPE (*Gallinago major*) may occasionally be met with on swampy places and heaths, and the Jack Snipe (*Gallinago gallinula*) is chiefly found in Britain in winter, and is generally seen by small streams or ditches. The length of the Great Snipe is about 12 in., and it feeds chiefly on insect larvæ of various kinds.

The RUFF (*Philomachus pugnax*) belongs to the sub-family Tringinae or Sandpipers, and is noted for the "setting" of neck feathers in the male, specially developed at the breeding season. This, called "ruff," is not developed until the second year of the male's life. The females are termed "reeves," at the sight of which the males, polygamous and outnumbering the females, fight desperately for the possession of their mates during the breeding season. The Ruffs are birds of passage, and less frequent in the fen districts than formerly. Taken in large nets and fattened, they are dressed for the table like woodcocks, without withdrawing the intestines or their contents, which are considered by connoisseurs as affording the most delicate kind of seasoning for these birds.

PARTLY USEFUL AND PARTLY INJURIOUS

The HOBBY (*Falco* or *Hypotriorchis subbuteo*), a member of the Falconidae (or Acciptrinae), is a summer visitant to this country, arriving in April. It haunts the cultivated parts of England, and

its favourite food is the lark. The upper parts are greyish-black, the feathers having lighter margins; the chin and throat, white; belly dull orange marked with arrow-head spots; quills dusky black. It builds in tall trees, sometimes making use of the deserted nest of a crow. The eggs are four in number, of a dirty white colour speckled with reddish-brown. The length of the bird is from 12 to 14 in. It feeds principally on small birds and large beetles, and may occasionally prey on small game, being very strong-winged, and was formerly a great favourite for the chase of small game when falconry was in fashion.

The SHORT-EARED OWL (*Otus* or *Strix brachyotus*), Fig. 48, belongs to the family Strigidae and sub-family Otinae or Owlets, and is more or less migratory in habits, though occasionally remaining in this country throughout the year. It generally arrives in the British Islands in autumn, and leaves this country at the beginning of spring.



FIG. 48.—THE SHORT-EARED OWL.

The Short-eared Owl is about 14½ in. in height, the female being rather larger than the male. The head, back and wings are lightish-brown with darker brown patches upon them. The wing

feathers are edged with buff or fawn colour, and the under-parts of the body are fawn with blackish markings upon the breast. The legs are pale buff and the toes black. The beak is also black, and the ears, as the tufts of feathers on the head, are brown. Its haunts are heath and moorland, bracken-districts, furzy downs, hill pastures, marshes, and sometimes meadows, turnip-fields and other tracts of highly-cultivated land. It chiefly, however, is found in the north of England and in Scotland, where, and in marshes, it is safe from molestation, there also being abundance of food. This consists of field and grass voles, mice and young rats, beetles and other insects in larval and pupal as well as adult stages. It also feeds upon young game both ground and winged, though, being migratory and for the most part leaving this country before the advent of the game-breeding season, the damage to game preserves is exceedingly small, there being very few short-eared owls outstaying the woodcocks, both arriving and departing about the same time, hence the term "woodcock owl." Indeed, the short-eared owl only exceptionally breeds in Britain, as in 1891 and 1892, when it nested freely, rearing two broods in a season. The nest is made generally in tufts of heather or furze, or in grassy spots, if marshy, on little hillocks covered with rushes and reeds. It is scooped out of the earth and lined with a little dry grass or moss. From four to seven eggs are generally laid, creamy white in colour, but as many as thirteen eggs have been found in a nest. The pellets cast near the nests are found to consist of the fur and bones of voles. Though occasionally seen flying by daylight, the short-eared owl works most in the twilight of dusk and dawn, when voles also are most on prowl.

The BLACKCAP WARBLER (*Sylvia* or *Curruca atricapilla*), Fig. 49, a member of the family *Sylvinae* or True Warblers, is nearly 6 in. long, and has the upper part of the head black, the hind part of the neck ashy brown, the upper parts of the body dark grey, with a greenish tinge, the throat, breast and belly silvery white, the legs bluish, the claws black, and the bill brown. The female is larger and has a darker plumage, but has not a black cap.

The blackcap warbler arrives in England at the end of April or early in May and departs therefrom in September. It is bold in habits, frequenting gardens, orchards, thick hedges, and coppices. Its song rivals, and by some is preferred to the nightingale, the tones being more pure, easy and flute-like, varied, smooth, and delicate, though possessing less volume, strength and expression. The nest is built among brambles or bushes, and formed of moss, dried grass and wool, lined with fibrous roots and some long hairs. The eggs, five to six, are reddish-brown marked with dark spots. It feeds upon insects, chiefly aphides and small caterpillars, on which the young are reared. It is also fond of late sweet cherries, raspberries and currants, and from its narrowness of body is difficult to exclude

with netting. It also feeds on wild fruits, such as ivy and elderberries. In its natural state it is a mocking bird, imitating the song of other birds, and in a cage soon learns the notes of the nightingale and canary.



FIG. 49.—THE BLACKCAP WARBLER AND RASPBERRY GRUB.

The GARDEN WARBLER (*Sylvia hortensis* or *salicaria*), included in the family Sylviadæ or Warblers, is 6 in. in length, and its colour brown above, abdomen white, and throat patch of white, brown tinted, and underwing coverts buff. It is active in habits, dwells in gardens and pleasure grounds, woodlands and hedges, arriving in Great Britain in April or May and departing from its shores in September. It builds a nest of a little moss, dried grass and wool, lined with fine fibrous roots and some long hairs, in a thick bush or hedge near the ground, and in it are laid four or five eggs, of a whitish-grey colour, spotted with brown, the spots being collected towards the larger end. The food consists of insects, particularly the small leaf-rolling caterpillars that infest apple and other fruit trees, feeding the young entirely upon insects. Its food, however, is varied with small fruit both wild and cultivated, but its depredations are not generally of a serious nature. This bird is the Beccafico of the Italians, so celebrated as a dainty for the table.

The FIELDFARE (*Turdus pilaris*), included in the Turdidæ or

Thrushes, is a stout bird and rather elegant with its long tail and wings. Its length is between 10 and 11 inches and its weight about 4 oz. The upper parts of the body as far as the shoulders are ashen grey dotted with dark spots on the head, back and wings red-brown and tail blackish-brown, chin and throat amber with numerous black streaks, breast reddish-brown spotted with black, abdomen and under-parts white, spotted in the flanks with shades of brown. It arrives in this country in November or December, and is generally seen in large flocks. It departs about May or June, though occasionally some remain to build in the wilder parts of the British Islands. The nests are usually built in society after the manner of rooks, but in fir or pine trees. It lays several bluish-green eggs, spotted with brown. It feeds upon worms, larvæ, insects, seeds and grain, also largely upon wild fruits, such as berries of hawthorn and holly, the latter being the measure of their depredations in gardens, and ornamental grounds, the hollies being soon divested of their berries by the fieldfares during severe weather. The bird's shyness on arrival soon wears off, and from its excellence as an adjunct to the table is much sought after by some sportsmen.

The REDWING (*Turdus iliacus*) included in the Turdinæ or True Thrushes, closely resembles the common thrush in its plumage, but is distinguished by the bright red colour of the underwing coverts. It visits Britain as a migratory bird in winter, migrating from more northern regions about the same time as the fieldfares, and departing with or even before them. Redwings congregate in flocks, often associated with fieldfares as jackdaws with rooks, and search the fields for worms and insects or larvæ, which, with hawthorn, holly and other berries, comprise their winter fare.

The TURTLE-DOVE (*Turtur auritus* or *communis*), Fig. 122, a member of the Columbidae or Pigeons, is about 11 in. long, and possesses four rows of black feathers, tipped with white along the sides of the neck; top of the head slaty brown, upper parts pale brown mottled with darker hue, abdomen and under-tail coverts white. The beak is brown and the legs and toes brownish-yellow. It arrives in England about the beginning of May, usually in small flocks, and shortly thereafter pairing. It is most commonly found in the southern counties, frequenting plantations, and particularly parks and pleasure grounds where there are fir-trees. In these situations turtle-doves are singularly pleasing from their cooing, and the graceful evolutions of the males render them great ornaments. The nest is a mere platform of twigs formed in the forked branch of a tree, the female laying two white eggs. The food consists chiefly of seeds, vegetation, such as young tops of swedes and turnips, and grain. Turtle-doves leave England at the beginning of September.

The CORN-CRAKE or LANDRAIL (*Crex pratensis*), Fig. 50, a member of the order Grallæ or Waders, and of the family Rallidæ, or Rails,

is of a reddish-brown colour. It is a regular visitant to Britain in summer, arriving in April and leaving in October. It lives in fields and nestles and runs among the long grass. The name is expressive of its cry, which may be so exactly imitated by drawing a quill sharply across the teeth of a comb, that the bird may be decoyed by the sound until quite close to the decoy-man.



FIG. 50.—THE CORN-CRAKE.

The Corn-crake is very averse to rising on the wing, and the young when taken feign death with admirable accuracy, nor do they move until they imagine that the intruder is safely out of the way. Once a parent bird assumed a death-like appearance in presence of capture of its young, but on these being released and safely ensconced in the long grass it opened its eyes and fled with a *crake*. The nest is formed of dried grass, collected and worked into some depression in the ground, and contains from eight to twelve eggs, of a greyish-yellow, covered with dark brown spots. The length of the bird is about 9 in. It feeds on worms, slugs, and insects, also, in due season, corn.

DESTRUCTIVE

The CROSSBILL (*Loxia curvirostra*) belongs to the family Fringillinæ and sub-family Loxinæ (Crossbills). It is found chiefly in the northern countries of Europe and occasionally visits Great Britain, sometimes in great numbers, and apparently for abstracting the seeds from fir cones, for which the bill is peculiarly adapted. It is from 6 to 6½ in. in length. The old male has a red plumage, and the young male a reddish one, inclining to yellow; the female is of a greenish colour. The birds build their nests and breed at all seasons of the year, in December, as in March, April and May. The

common crossbills sometimes do considerable injury to apples, tearing them in pieces to come at the pips or seeds.

The COMMON TERN OR SEA-SWALLOW (*Sterna hirundo*), Fig. 51, is a member of the Natatorial or Swimming Birds of the Laridæ or Gull family and sub-family Sterninæ, arriving on British shores in May and leaving them in September. Its average length is 15 in., the long-forked tail forming a considerable part of this measurement. The head and neck are black and the upper part generally ashy-grey, whilst the lower parts are white, and the legs, feet and bill red. It is very active, seemingly in ceaseless flight, and darting down upon small fishes, which constitute its food. Its cry is noisy and jarring. The nest is made on the sand or rock above high-water mark, and contains two or three eggs, on which the female usually sits by night.

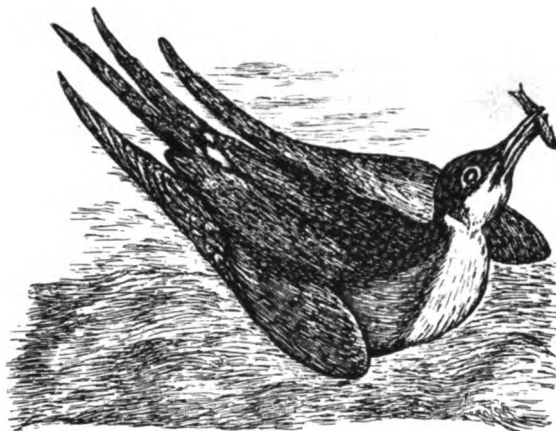


FIG. 51.—THE COMMON TERN OR SEA-SWALLOW.

As evidence of the destructive nature of the Common Tern, it is noteworthy that the East Suffolk County Council was in 1906 petitioned by 100 fishermen of Aldeburgh to rescind the order prohibiting the taking of the eggs of the common tern, as during the last ten years the birds had greatly increased, and the smelt fishing industry had been nearly destroyed. It was estimated that there were 40,000 birds in the district, and one bird alone had been seen to take thirty to forty young fry in an hour. The council decided to allow the order to expire in January, 1907.

CHAPTER IV

REPTILES

HARMLESS

THE COMMON LIZARD (*Lacerta* or *Zootoca vivipara*), Fig. 52, belongs to the family Lacertidæ or True Lizards, in which the body is covered with scales, which are largest on the abdomen and the head. The head is not provided with a throat-pouch. The legs are four in number, the toes number five, and are unequal in length. The tail is cylindrical, elongated, and often longer than the body. The tongue is cleft or bifid and protrusible.

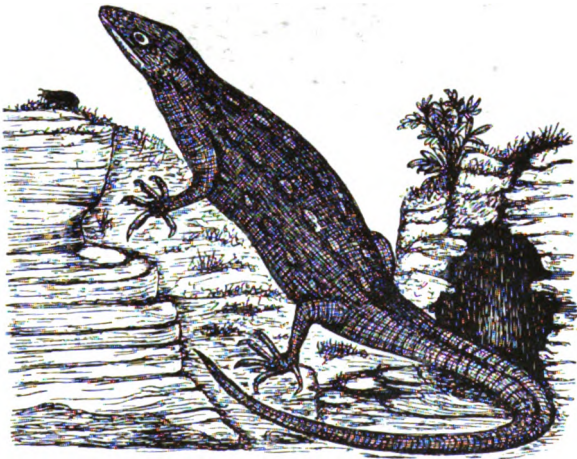


FIG. 52.—THE COMMON OR SCALY LIZARD.

The Common Lizard is about 6 in. in length, terrestrial in habits and is found in comparatively dry places. It is viviparous, the eggs being retained within the parent's body until such time as the young are nearly or actually hatched. It is very active,

disappearing quickly when alarmed, and when seized its tail frequently snaps off. It feeds upon insects and their larvæ, also crustacea (woodlice).

The SAND LIZARD (*Lacerta agilis*) is considerably larger than the common lizard, as it sometimes measures a foot in length. It frequents sandy heaths, and in the sand its eggs, fourteen or fifteen in number, are deposited. The eggs are hatched by the heat of the sun, and the young immediately lead an independent life. During the winter this, also the common lizard, hibernates in a burrow and does not again make its appearance until the spring. It feeds upon insects.

BLIND-WORM or SLOW-WORM (*Anguis fragilis*), Fig. 53, belongs to the skink family (*Scincidæ*), and forms a connecting link between

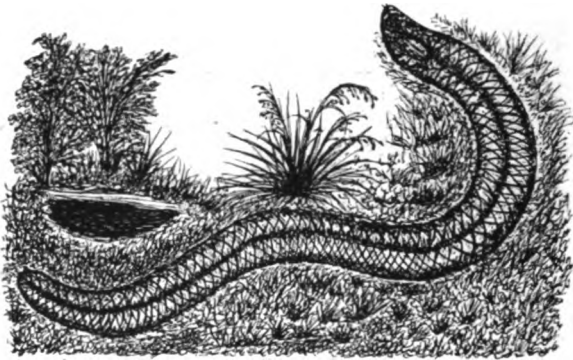


FIG. 53.—THE BLIND-WORM OR SLOW-WORM.

the lizards and the snakes. Though snake-like in form and having no appearance of external limbs, the bones of the shoulders and pelvis exist in a rudimentary form. It is about 1 ft. in length, nearly equal in thickness, but rather more slender towards the tail, the tip of which is abrupt. The upper surface is brownish-grey with a silvery sheen, a black line running down the middle of the back, several rows of obscure dark dots being present at the sides, and the under-parts are bluish-black. Eyes very small, but brilliant, hence the name "blind-worm."

The Blind-worm is found in every part of Great Britain, but not in Ireland. Country people, like Shakespeare, regard it as the "eyeless venomous worm" and have a dread of the "blind-worm's sting," but both without cause, as it rarely bites, and scarcely makes any impression on the skin, its teeth being very small. When frightened, it so stiffens its muscles and becomes so rigid that its tail snaps off with a slight blow; even its fright is so great sometimes that it leaves this member behind it. Its food consists of worms,

slugs, and insects. In summer it basks in the sun on a sunny bank, beneath a hedge, or under rocks or old walls. During winter it remains in a state of torpidity, generally burrowing or taking advantage of clefts in the ground beyond the reach of frost, for the purpose of hybernating. It is ova-viviparous, the young being hatched from the egg in the body of the parent before being brought into the world.

The COMMON RINGED OR GRASS SNAKE (*Tropidonotus* or *Coluber natrix*) (Fig. 54) belongs to the sub-order Colubrina of the order Ophidia (serpents), the species name meaning Water Snake, and is characterized by the large size of the upper mandible and by these bones possessing solid teeth utterly devoid of a poison apparatus. The head is of rounded shape, and the upper surface is covered by *scuta* or scales of large size.

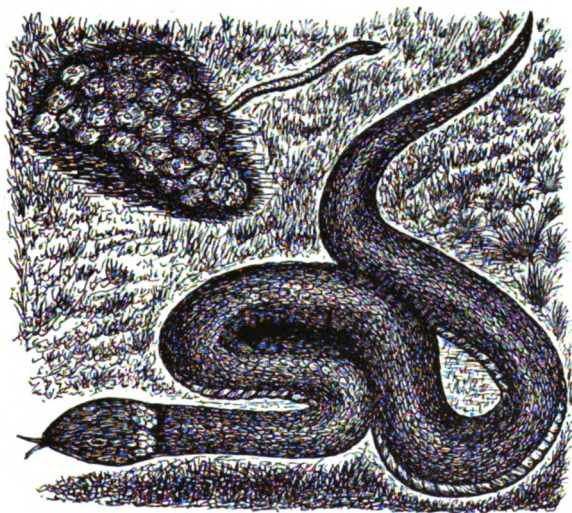


FIG. 54.—THE COMMON RINGED OR GRASS SNAKE.

The Ringed or Grass Snake is found in grassy places such as marshy land, hedges by a wet ditch, and other situations where there is plenty of cover for safe retreat. Unlike the viper, which shuns the vicinity of man, the ringed snake (easily distinguished by the bright band behind the head, a tinge of red sometimes giving to the yellow an orange tint, and another band of deep black runs just behind the yellow) seems not to fear human presence, but enters pleasure grounds and gardens, and penetrates even to hotbed frames and other warm places for depositing its eggs. Leaf piles, rubbish and manure heaps are favourite localities for the eggs, also an old

haystack bottom, whence the example shown at the upper left-hand corner of the illustration was taken, the string of eggs being joined together like a set of large oval beads, soft parchment-like, and white in colour. The ringed snake feeds upon frogs, slugs, woodlice, insects and their larvæ, also grass voles and mice, and some say unfledged small birds. It is torpid in winter, and generally destroyed when found. It is perfectly harmless and may be tamed. In captivity it will feed on beetles, cockroaches, mealworms and similar creatures, also drink milk and eat bread soaked in it. When much alarmed it gives off an offensive odour, therefore should be seized with a leather gloved hand and not allowed to touch either the skin or clothes of the captor. The ringed snake casts its skin several times during the year. The entire skin comes off, even the covering of the eyes. A rent opens in the neck, and the snake, by entangling itself in thick grass or bushes, actually creeps out of its skin, turning it inside out in the effort. It is an excellent swimmer, gliding on the water in a very graceful manner.

The COMMON FROG (*Rana temporaria*), Fig. 55, is the type of the order Anurous Amphibia or Batrachians, and belongs to the family

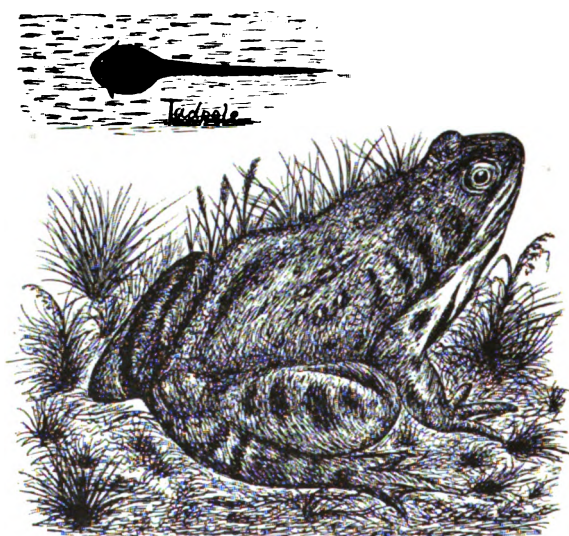


FIG. 55.—THE COMMON FROG AND TADPOLE.

Ranidæ (frogs). It is characterized by having the skin smooth, the hind legs long, and the feet webbed. Thus it swims with great vigour, and on land progresses by a series of leaps. By its smooth soft skin it absorbs fluids rapidly, and thus has a double function

both in nutrition and as an aid to respiration. It is an air-breather, but is capable of remaining for a considerable time under water. It retires in winter to the bottom of ponds and marshes, numbers usually congregating and burying themselves in the mud. This hibernation ends in February, and breeding shortly afterwards begins.

In March the spawn is deposited in masses, to which several individuals contribute, each furnishing many hundred eggs as gelatinous masses with blackish globules scattered through them. These globules soon manifest change, and after a time the young escapes as a tadpole with a short body, circular suckorial mouth and long tail, gills projecting on either side of the head, which answers in position to the gill-opening of fishes. The hind limbs first appear as buds, later the fore-limbs project, the gills disappear as the lungs become more fully developed, and the tail gradually shrinks and disappears, and the animal, which is first fish-like, closely resembling a Urodele Amphibian (or newt), finally assumes the anourous or adult form. The process is that of metamorphosis, since there is a change not merely of form and proportion, but of internal organs. In its tadpole state the animal was essentially amphibious, but after its change has taken place it is not able to exist under water for any great length of time, but is forced to come to surface to breathe, and be able to live on land. In the successive stages of its development each resembles the adult form of a lower group of animals; but there has been no passage of one form into another, they have rather descended from common ancestors, and the fish and newt have each reached a stage beyond which the frog has become developed. The frog is most active after rain, when, squatted in the grass, its abdomen rapidly absorbs water. It is found in meadows and other damp places during summer. The food of the frog consists of worms, slugs, woodlice, millipedes, and insects, including their larvæ, and it greedily devours wireworms. The prey is captured by means of the tongue, which is covered with a viscid secretion and is attached in front, its free border being behind; it is rapidly projected from the mouth, the insect adheres to it, and is at once swallowed.

The COMMON TOAD (*Bufo vulgaris*), Fig. 56, belongs to the order Anoura of amphibian Vertebrata and family Bufonidæ, which is distinguished by the toes of the hind feet being slightly webbed, but not so perfectly as in the frogs. The toes of the front limbs are not connected by a web. The skin is very prominently provided with warty tubercles and glandular bodies, and paratoid glands (borne on the sides of the head) are developed. A well-developed tongue exists, but no teeth are developed; the tongue is fixed to the front of the mouth, but is free posteriorly, this latter being protrusible.

The toad passes through a metamorphosis, appearing first as a tadpole, breathing by outside and then by internal gills, and finally,

after losing its tail and developing lungs, leaving the water and appearing in its adult state as a terrestrial and lung-breathing form. The toads visit the water in March or April, their breeding season, for the purpose of depositing their eggs, which are deposited in long strings, the male drawing the eggs out of the female's body. In habits the toad is nocturnal, prowling about nearly everywhere in the evening in quest of prey. It hides by day among stones, grass, coarse herbage, leaves, rubbish, etc. It feeds upon slugs, woodlice, flies, earwigs, and other insects, including their larvæ, such as caterpillars. During winter the toad hibernates, choosing a hole in the ground, frequently at the root of a tree and in clefts of rock or heaps of stones, and passes the winter in solitary dignity.

The popular repugnance to the toad rests mainly on its unprepossessing and outward appearance, for no venom or poison apparatus exists in this very useful creature, and save that the secretion of the skin may be of an acrid or irritant nature when brought in contact with cut or exposed surfaces, it is utterly harmless in every



FIG. 56.—THE COMMON TOAD AND WOODLICE.

way. The toad is easily tamed, and in a garden or plant-house one of the most useful creatures. Reports of toads having been found immured in solid rocks, where they must have remained for ages, and yet crawling about lively and well on being released, are published every year. Objections, however, to their reception may be found: firstly, that the rock was solid; secondly, that the relaters of such tales seldom notice the circumstances of imprisonment, and "jump to conclusions" on superstitious ideas; and thirdly, the possibility of the toad gaining admittance through a crack in the rock while quite young, and there subsisting on insects, whilst its increasing growth prevents its escape from the cavity in which it is found on the rock being broken up. Similar remarks apply to toads said to be found in the "hearts" of trees, this being always

at the butt, where many trees are more or less hollow, and the opening from below, though not perhaps corresponding to where the toad is located. It appears not to be known that a rent or cleft in the solid wood of a tree never closes, and in this a toad may have crept when young and not been able to escape; but whilst the tree was occluding the fissure it increased in size by feeding on insects, or, particularly, woodlice (*crustacea*), and was ultimately apparently entombed by new bark and wood over the aperture by which the toad at first entered, though it is doubtful if it be entirely deprived of food and air. Experiments conducted by Dr. Buckland in 1825 demonstrated that toads from which all air was cut off, died before a year's imprisonment.

The SMOOTH NEWT or EFT (*Triton tæniatus* or *aquaticus*) is included in the order Urodela ("tailed") of Amphibians, and in common with all other members of the Amphibians are *Caduci-*

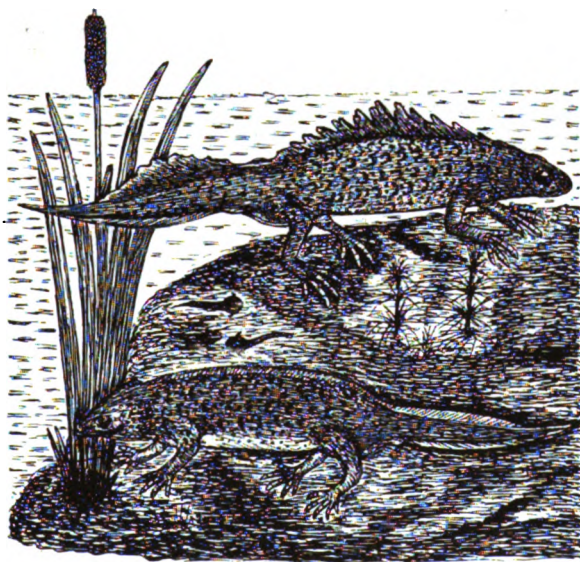


FIG. 57.—THE GREAT WATER-NEWT, MALE AND FEMALE.

branchiate forms, that is, the gills, with which they are provided in early life, disappear on their attaining maturity. The newt is oviparous, that is, producing eggs from which the young are afterwards hatched. It commences life as a tadpole, the larval gills being cast off about the third month of existence, when it breathes by lungs. The larval tail is retained throughout life. The tongue is free, and two rows of teeth are borne on the palate. The front legs appear first in order of development, and possess four toes, the

hinder feet being provided with five toes. The male animal is distinguished by a crest or fleshy ridge borne on the back, and is displayed to greatest advantage when in the water. In habits the common or lesser newt is semi-aquatic, frequenting meadows and other damp places in summer, and lives upon small worms, slugs, woodlice, insects and their larvæ. It is about 3 in. in length; feeds in water on aquatic insects, larvæ, etc. In winter the common newt is torpid, usually on land.

The GREAT WATER-NEWT (*Triton cristatus*), Fig. 57, measures about 6 in. in length when fully grown. It is coloured dark brown on the upper parts, the sides being of a whitish colour, whilst the belly is of an orange colour spotted with black. It is common in our fresh-water pools and ponds, the crest in the male animal being very conspicuous.

The great water-newt feeds upon water insects and larvæ, also tadpoles, and on land is similar in its habits to the lesser newt. In winter it is torpid. Many people have a great horror of newts, though they are perfectly harmless. The popular superstition is that a bite of an "eft" causes the loss of the limb bitten, and that cows or other animals drinking from a pond and swallowing an eft are sure to come to an untimely end.

DANGEROUS

The COMMON VIPER OR ADDER (*Pelias berus*), Fig. 58, belongs to the order Ophidia of the class Reptilia, and to the section Viperina,

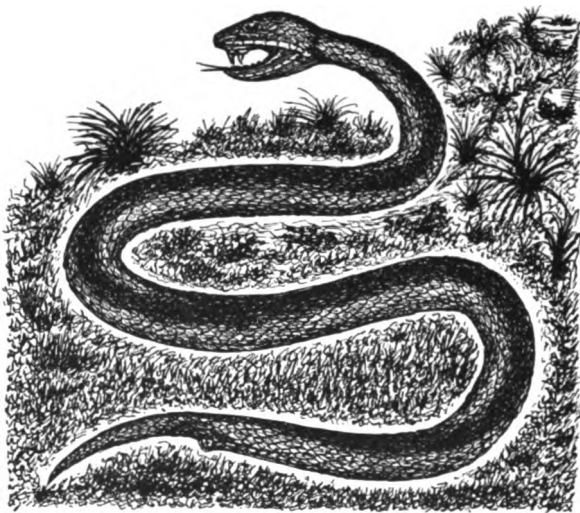


FIG. 58.—THE COMMON VIPER OR ADDER.

family Viperidæ or Vipers. The upper maxillæ bear two canaliculated fangs and are of small size. The palate bears two rows of teeth, and the lower jaw is provided with a row on each side. The head is of triangular shape, broadest behind, and the scales covering the head are small.

The Common Viper or Adder is the only venomous reptile inhabiting Britain, and, semi-gregarious or local in distribution, it is most prevalent in sandy heaths, and other relatively hot and dry places. It has retreats in the ground, and is torpid in winter. Unless "cornered" or trod upon it seldom attempts to "strike," but when opportunity offers speedily disappears from the presence of man. If "pinned" or trodden upon it strikes and bites fiercely, the bite being venomous, induces pain, sickness, even delirium, and sometimes proves fatal. The adder is seldom found in gardens or cultivated grounds, remaining hidden in the forest, heath, or hayfield, shunning, as a rule, the neighbourhood of man. Its food consists of grass-voles, frogs, unfledged small birds, hatching eggs, insects and their larvæ. The adder is viviparous, and it is asserted that when danger threatens, the female viper opens her mouth and permits her brood to hide themselves, but this is by no means an ascertained fact.

CHAPTER V

GAME

THE term *game* applies to certain wild animals and birds pursued for sport, and the killing or even pursuit of them regulated by the Game Laws. But in a popular sense many wild animals and birds are regarded as game, although not so designated in the Acts, and some, such as the landrail, snipe and woodcock, cannot be legally shot without a game licence. Those of these so-called game that are wholly dependent upon Nature for subsistence have been included in the preceding pages. Under game, therefore, will be embraced other wild animals and birds not strictly that, although protected by law, mainly for affording sport and also food, etc., to the nation. Thus, in this connexion, reference is made to game reared, fed, and outside, as well as within the respective coverts, feeding on cultivated crops or produce of land which is suitable for afforestation, agricultural, and horticultural cultivation, according to location, and soil adaptation.

LARGE GAME

The STAG or RED DEER (*Cervus elaphus*), Fig. 59, belongs to the order Ruminantia, or ruminating animals, and is included in the family Cervidæ. The adults, male and female, in the summer have the back, flanks and outside of the thighs fulvous brown, with a blackish line running down the spine, marked on each side with a row of pale fulvous spots. In winter, these parts are of a uniform grey-brown, and the head, sides of the neck, and underparts of the body and legs are also grey-brown; the buttocks and tail are always pale buff. The young, during the first six months, are brown spotted with white. The male (stag) is distinguished from the female (hind) by the magnificent branching horns, the long bristly hair of the throat, and the canine teeth in the upper jaw. The first year the horns are represented by a knob or protuberance; the second year by pointed spikes; the third year by two or three tines or antlers, and the horns become more branched every year up to the seventh. After this the horns do not generally increase in the number of branches, but become thicker and stronger. The horns are shed in spring, the old stags first, and the young last,

and the new horns are completed about the month of August. The rutting season follows in September, when the males become exceedingly fierce, waging desperate contests with each other, and sometimes attacking other animals and men. The hind goes with young eight months and some days. The calf (fawn) is dropped in May or the beginning of June, and remains with the hind all the summer. In winter red deer of all ages and both sexes congregate in herds, from which the older stags and the hinds withdraw as the spring approaches. The stag is very swift, and is an excellent swimmer. Stag-hunting has always been a favourite amusement among the great, and still is practised similarly to fox-hunting, but with *tame* deer, in a few districts in England, while deer-stalking is a



FIG. 59.—THE RED DEER.

favourite pastime of the wealthy in the Highlands of Scotland. Formerly the stag was protected by the most stringent forest laws. William the Conqueror is said to have "loved the tall deer as if he had been their father," and to kill a man was a slighter offence than to kill a deer. Red deer only exist wild in Great Britain in the Highlands of Scotland.

Red deer, astray, cause considerable damage during the night-time to meadows and farm crops, also in orchards when the apples and pears are beginning to ripen. The hinds eat voraciously of all the fruit within their reach, while the stags stand on their hind legs for the purpose of bringing down the smaller fruit-laden branches. In the forest these animals are also notable for :

1. Biting off the top buds and succulent shoots of young ash, aspen, beech, hazel, hornbeam, larch, maple, oak, silver fir, sycamore, and willow, also, in lesser degree, birch, elm, Scots pine, and spruce, during the late autumn and winter months.

2. Gnawing and stripping the bark from oak of fifteen to twenty years of age, and spruce of twenty to forty years, while alder, birch, larch, Austrian and Scots pine seldom suffer after attaining an age of twenty years. The "stripping" usually takes place in the spring and summer months, and more frequently by stags than hinds; "gnawing" mostly occurs during the winter months. The wounds heal most quickly in ash, larch, oak, Weymouth pine, and silver fir; very slowly in maple, sycamore and spruce.

3. Rubbing the velvet from their antlers during July and August, and again towards the beginning of autumn, using sapling aspen, horse chestnut, larch, lime, maple, Weymouth pine, silver fir, and willow as "fraying" stocks; the fraying taking place at night, and scattered trees being most exposed to danger.

4. Treading down the growth of young seedlings and transplanted trees with their sharp-cutting, horny hoofs.

The FALLOW DEER (*Cervus dama* or *Dama vulgaris*), Fig. 60, is about 3 ft. high at the shoulder, and is easily distinguished from the stag by its spotted coat, longer tail, and palmated horns. In summer both the male (buck) and female (doe) have the back, flanks, and thighs of a fulvous brown colour, with numerous white spots; in winter these parts are wholly brown; the buttocks are always white with a black streak on either side; a dark line passes along the back; the belly, inside of the limbs and under-surface of the throat are white. The young fallow-deer is called a *fawn*, the second year a *pricket*, the third year a *buck of the first head*.

Fallow-deer exist in this country only in a semi-wild state, having, it is said, been introduced by James I, at that time James VI of Scotland. Large numbers of fallow-deer are kept in parks, where they congregate in large herds, a large buck always taking the lead, and suffering none but a few favourite does to approach his regal presence, all the other bucks running away directly he makes his appearance. Though generally tame and suffering people to come very close to them, fallow-deer, like red-deer, will not allow any one to approach their domains at certain times (rutting and fawning). Their flesh is excellent, and far superior to that of the red-deer. The skin furnishes excellent leather, and the horns, besides producing ammonia or hartshorn, are made into knife-handles and other articles.

Fallow-deer are similar in proclivities for inflicting injury as red-deer, but differ in being:

1. More restless and dainty in grazing, hence they commit more damage by nibbling young growth, and trampling under foot, especially recently-introduced trees.

2. Less prone to gnawing and stripping the bark off saplings, this only occurring in deer-parks, or very seldom in forests.

3. Later in fraying the velvet from the antlers, yet, like red-deer, selecting uncommon species of trees as fraying posts.



FIG. 60.—THE FALLOW DEER.

The ROEBUCK or ROE-DEER (*Capreolus capræa* or *Cervus capreolus*), Fig. 61, once common throughout Britain, is now restricted to the northern half of Scotland. It is smaller than the fallow-deer, being about 2 ft. 3 in. at the shoulder, and its horns are comparatively small and little branched. The colour is bright reddish in summer, the under-parts white. It does not live in herds like the fallow-deer, but singly or in pairs, driving off its young when they are about nine or ten months old.

Roe-deer, as regards damage, is notable for :

1. Nibbling and browsing on the buds and young shoots of acacia, ash, aspen, beech, larch, maple, oak, silver fir, and sycamore ; also, in lesser degree, pines and spruces, and, least of all, alders and birches.

2. Gnawing young trees most during the winter months in plantations with a southern or south-western exposure, hence least on northern or north-eastern slopes.

3. Not gnawing or stripping the bark off saplings or trees of pole size.

4. Bucks selecting smooth, small saplings as fraying-stocks when clearing their horns of velvet, and again during the rutting season,

preference being given to acacia, alder, aspen, larch, lime, mountain ash, Weymouth pine, and silver fir, trees on the edges of drives or glades suffering in greatest degree.

5. Varying their ordinary food with beechnuts and acorns, or with the cotyledons of seedling beech and oak.



FIG. 61.—THE ROEBUCK.

GROUND GAME

This term applies to hares and rabbits, both belonging to the order Rodentia, or gnawing animals, and included in the family Leporidae (hare kind), which is distinguished by its members possessing two small incisors in the upper jaw in addition to the two ordinary incisors, thus making four incisors in the upper and two in the lower jaw, whilst no canines exist in either jaw. The pro-molars number six in the upper and four in the lower jaw, and the molars exist to the number of six in each jaw. The latter two kinds of teeth are destitute of roots, and the clavicles or collar bones are of a rudimentary nature. The front feet possess five and the hinder four toes, and the hind legs exceed the forelimbs in length. The tail is short and erect, and the two orbits or eye cavities of the skull communicate by an aperture in the septum or partition which divides them. The hare possesses a redder fur than the rabbit and greater length of ears, which are tipped with black. The hind legs in the hare are proportionately longer than in the rabbit, and the eyes are larger and more prominent. The

rabbit differs from the hare by its generally smaller size, by the shorter ears of uniform brown colour, and by the shorter limbs. The rabbit seems to have no social feeling for the hare, and it rarely happens that a hybrid progeny of the two species is produced. In such cases, with one or two exceptions, the father of the hybrids has invariably been a rabbit and the mother a hare.

The COMMON HARE (*Lepus timidus*), Fig. 62, is tawny red on the back and sides, and white on the belly. The ears are very long and tipped with black; the eyes are very large and prominent. The length of the animal is about 2 ft., and when full grown it weighs 6 to 8 lb. It is always lean, and from the form of its legs, runs swifter up hill than on level ground. It runs by a kind of leaping pace, and in walking uses the hind feet as far as the heel. It is hunted both for the sport and its flesh. When hunted with greyhounds, the amusement is called *coursing*. Beagles are also used for the same purpose, but they do not pursue and capture the hare by sight and speed, like the greyhound, but by scent, patiently following its track, until the wearied animal is no longer capable of escaping. The voice of the hare is never heard but when it is seized or wounded. At such times it utters a sharp, loud cry. The flesh of the hare, forbidden to be eaten by the Jews and ancient Britons, was held in great esteem by the Romans, and is now much prized for its peculiar flavour, though it is very dark in colour, dry, and devoid of fat.

The hare breeds three or four times a year. The female goes with young about a month, generally producing two to four at a litter. The eyes of the young hares, called leverets, are open at birth, and they possess the gifts of hearing and speed from birth. The dam suckles them about twenty days, after which they leave her, and procure their own food. The leveret (a hare of the first year) as well as the adult hare, makes a sort of nest among grasses both in coverts and in the open where sufficiently protective, and in this, called a "form," lies crouched to the ground with the ears laid along the back, and trusting to its concealment will often remain quiet until the foot of an intruder almost touches it. The hare is short lived, never attaining more than seven or eight years.

The common hare lives entirely on vegetable food. Hiding by day in coverts or places affording the needful growth of herbage for "forms" and seclusion, the hares come out in the afternoon, evening and at night, according to circumstances, to exercise, forage, and feed. They roam afar through the fields, and where numerous cut and clear away large open spaces to allow them more room for play, and in the large amount of sustenance before them they bite down and wantonly destroy more than they can possibly consume. No crop escapes their ravages, hardly any plant in forest, field, or garden is free from their attacks.

Hares commit great havoc amongst forest trees, especially in the

winter months and in frosty weather when food is scarce; then they will peel off the bark of young trees of stake or even pole thickness of stem, exhibiting preference for ash, aspen, beech, elm, hornbeam, maple, oak, and sycamore. Conifers generally attract hares in less degree than broad-leaved trees, in particular Scots and Austrian pines and spruce, Corsican pine being rarely attacked. But in comparatively unwooded tracts, like many of the English, Welsh and Scottish moors, it is often appalling to see the damage inflicted on larch, pines, and spruce, during hard winters, in young plantations, as the hares flock from the neighbouring hill-districts and moors in such numbers as to render afforestation practically impossible without wire-netting protection. On the residential portions of estates and in ornamental coverts and parks, wherever they have marked opportunities of choice, hares single out the papilionaceous species of trees, such as the thorn acacia (*Robinia pseudacacia*),

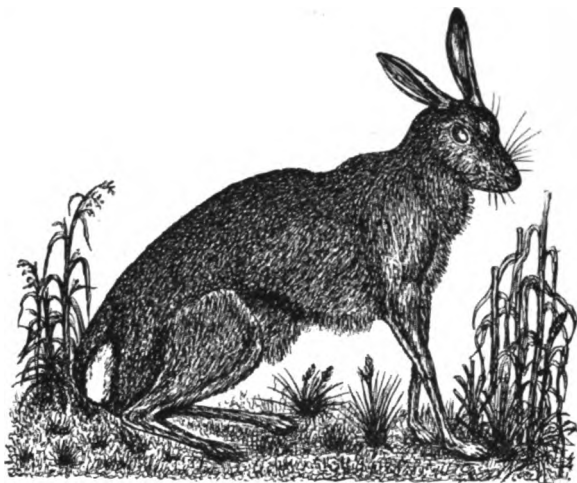


FIG. 62.—THE COMMON HARE.

honey locust (*Gleditsia triacanthos*), and even the assumed poisonous Scots and common Laburnums (*L. alpinum* and *L. vulgare*), for gnawing and stripping off the bark of the stems. Hares also nip off, apparently for mere mischief, the shoots in woods and plantations, and those of shrubs and trees in nurseries, shrubberies and gardens, thus checking their growth, so that they never attain their proper shape and size, forest trees being ruined as regards producing timber. In winter time, during severe frost and the ground snow-covered, hares nibble and devour the young growths of conifers, broad-leaved trees and shrubs, both deciduous and evergreen,

within their reach, always showing preference for the papilionaceous gorse (*Ulex europæus*), particularly in ornamental coverts the double gorse (*Ulex europæus, flore plena*) and common broom (*Cytisus scoparius*), these and heather (*Calluna vulgaris*) being browsed down to the snow-line. Probably the presence of gorse, tufts of coarse grasses, with brakes here and there of bracken (*Pteris aquilina*) and bramble (*Rubus fruticosus*) affording shelter and dry "forms," with a look-out on considerable breadths and lengths of velvety lawn producing tender blades of grass and rich leguminous herbage, culminating on wide tracts of heather, accounts for the gathering of hares to moorsides in the autumn, whence they make nightly incursions to the moor-edge farms for feeding on the outstanding crops.

On agricultural crops hares make persistent onslaughts. Wheat and rye, oats and barley suffer from the time of the appearance of the young and tender blade above ground to that of harvest. They nip off the young shoots of cereals, inducing a stunted, much-branched habit, bearing feeble "ears" and almost worthless grain, whilst thus made to arrive later at maturity and militating against the general harvest both in respect of time and value of crop. When the cereals are advanced in growth, hares bite off the culms at the joints for obtaining the sugary matter found there, and in this way often make path-like openings in standing corn of 2 ft. or more breadth, while there and abutting on the covert a considerable extent of the ground occupied (or should be) by the corn is made to have the appearance of stubble. Hares roam afar through fields and cut and clear away more or less large open spaces in corn crops, weakening and stunting the plants, thus insuring free access and a succession of tender growths for browsing, a matter of consequence to them in dry seasons, when their destructiveness is most pronounced and ruinous to farmers.

Carrots and mangolds are much relished by hares when the plant is young, and right away to maturity "tit-bits" are nibbled off the plants, the portions of the fleshy roots above ground being bitten and eaten; and as attention is given to numerous plants, the havoc, aided by rain and frost, involves a corresponding proportion of the crop, sometimes from damage in the field and non-keeping in store, resulting in half, or even the whole, spoiling. Turnips and swedes suffer in the bulbs from hares nibbling small pieces from numerous "roots," resulting in great decay and corresponding loss. Winter carrots, and above all winter tares, with the ever attractive parsley, have little chance of succeeding where hares abound, it being almost hopeless trying to raise a crop.

To forage crops hares are particularly destructive, preferring the artificial grasses—clovers and trefoil, with lucerne and sainfoin—to the native grasses and leguminous herbage, probably because more succulent and nutritious, and also through being less stained

and fouled by themselves or their near relatives, the rabbits, which so foul natural pastures where they abound that neither cattle nor sheep will touch the herbage, or hares remain on land fouled by these rodents. By nibbling and eating off the tender growths, the clovers, trefoil, lucerne and sainfoin are much injured, being deprived of their growing extremities; and thus stunted and dwarfed, the crop is seriously deteriorated in bulk and in value, tracks being made through the crop; these and patches being depastured in bad cases. The rotation grasses suffer less than the clovers, etc., rye-grass making most headway and persisting longest against attacks by hares.

In hop-gardens hares bite off the tender bines of the hop plants, and even when the bine has ascended and is high up the pole they sever it, whilst relatively tender, at such distance from the ground as they can reach, and thus cause it to wither and die, stunting the plant and spoiling the prospective crop in proportion to the extent of the bine destruction. Market-garden crops also suffer from the onslaughts of hares, as nearly all the vegetables raised in fields, allotments and gardens are eaten, it being difficult to discover a crop they will not nibble and render uneven and unremunerative.

In fruit plantations and orchards, hares commit very extensive damage to young fruit-trees, barking the branches of dwarfs as well as the stems of these and standards, the apple trees suffering most, cherry and plum trees in a lesser degree, and pear trees, as a rule, are still less liable to damage. In very severe weather and snow covering the ground, hares will make incursions into villages and do considerable harm to young fruit-trees in cottage gardens, stripping off the bark, and, if all round the stem, killing the trees, sometimes when of size coming into remunerative bearing. Nurserymen, fruit-growers, and all interested in fruit production, from the Crown down to the humblest occupier, know to their cost that hares inflict great damage on young apple and pear, damson and plum trees, and that unless protected where hares abound fruit-growing is precluded. Similar remarks apply to pleasure grounds, flower gardens, and vegetable grounds, all being made safe against the attacks of hares, if expected to afford a fair profit.

The MOUNTAIN OR BLUE HARE (*Lepus variabilis*), Fig. 63, is distinguished from the common hare by its shorter ears, notched upper grinder, smaller size, less speed, changing its colour to white in winter, and having only two broods in the year. It is confined to mountainous regions, such as the Highlands of Scotland. In comparatively unwooded tracts the blue hares flock from all the neighbouring hilly districts to young plantations of larch, pine, and spruce, and cut off all growth within reach above the snow-line, not sparing the leaders of young trees or even stems, those of three or more years age being girdled, and the plantation ruined as regards producing timber. Indeed, it is impossible to rear planta-

tions with the object of growing timber unless they are made proof against hares for several years after planting, particularly in moorland and hilly districts.



FIG. 63.—THE MOUNTAIN OR BLUE HARE.

The RABBIT (*Lepus cuniculus*), Fig. 64, is not a native of Britain but was introduced into this country from Spain. It differs from the hare by its generally smaller size, by its shorter ears, of uniform brown colour, and by the shorter limbs, consequently lesser speed. The rabbit is social and burrowing in its habits, numbers of individuals congregating together and forming colonies, which, reared and preserved, are called "warrens." Rabbits always select the situations best suitable for burrowing, such as sandy pastures and hill-slopes, knolls on commons, outskirts of woods, and hedge banks. The burrows which the rabbits excavate are irregularly disposed, and communicate freely with each other. Rabbits are extremely prolific, and begin to breed when about six months old. They may breed six or seven times a year, producing from five to seven or eight at a birth.

The parturient rabbit excavates a special burrow for herself in which to give birth to and shelter her progeny. The "nest" is lined with down plucked from her own body. The young are hairless when born and have their eyes closed. The eyes open about the tenth or twelfth day. When about half grown the young rabbits are highly esteemed as food, and the flesh of the full-grown rabbit is greatly appreciated. Besides, the skin is of value, being largely employed in the manufacture of felt hats, muffs, furs, and boas. The refuse—skin, ears and feet—are also used as articles of manure in fruit-growing and hop-producing districts.

Rabbits are less given to roaming over wide areas than hares. From the burrows outwards the rabbits clear almost everything edible before them, thus making sure of a full "look out," a velvety lawn, and supply of tender herbage. Nevertheless, rabbits will go a long distance for feeding on any special food-crop they delight in, such as a field of carrots, parsnips, parsley, turnips, swedes, winter tares, clovers, etc. Indeed, they devour almost every description of agricultural crop, including, besides those named under hares, beans, peas, and potatoes, the injury inflicted being most marked in dry seasons, the stunting of the plants favouring their depredations. Though having less aversion to wild grasses than hares, the rabbits so foul pastures that neither cattle nor sheep eat herbage on land tainted excessively by them. This chiefly occurs near the burrows, on borders of woods and plantations, from whence the rabbits come out to browse on meadows and pastures, eating off the



FIG. 64.—THE RABBIT.

herbage and also closely cropping cereal and other crops for a considerable distance from the boundaries.

Rabbits injure young plantations by nibbling the shoots and gnawing the stems of the trees and shrubs, always interfering with the growth and often destroying the plants: thorn, acacia, ash, broom, gorse, hazel, and hornbeam, with larch, Austrian pine, Scots pine, and Norway spruce being generally preferred. Even in wooded districts few species of conifers or broad-leaved plants escape nibbling and gnawing by rabbits in severe winters, while young plantations are soon ruined where rabbits are numerous and with snow on the ground for several weeks. On sandy land in moors and hilly districts where woods occur here and there, rabbits overrun recently formed plantations, nibble the young shoots and girdle the stems of nearly all trees, burrowing in certain places and damaging the roots.

In parks, ornamental coverts, and pleasure grounds, also in orchards, rabbits have "tastes," as the following record of their doings, aided by hares, during a severe winter, testify :

TREES AND SHRUBS DAMAGED, OR INJURED, WHILST SNOW ON THE GROUND FOR SEVERAL WEEKS.

Destroyed by eating or peeling at or down to snow-line. Apple-trees (some of thirty years' growth), Colchic and common laurels, hemlock spruces, hollies, Irish heather (*Dabæcia*, syn. *Menziesia polifolia* and varieties—excellent fodder), Japan cedars, laurus-tinus, roses, skimmias, sweet bays, and yuccas.

Shoots eaten and stems seriously injured. American oaks, ashes (often barked), Austrian pine (badly), brooms (excellent fodder), common silver fir (also Balm of Gilead and Frazer's), elms, evergreen oaks, furze (capital food), heaths, holly-leaved berberry (good fodder), horse-chestnut, junipers (much relished), laburnums (commonly barked), larches, limes, mountain ash, Norway maple, Norway spruce, oaks, ornamental crabs and pears, poplars, Scots pine, Spanish chestnut, sycamore, white and red cedars, and willows (except bitter).

Young growths nibbled or gnawed off. *Araucaria imbricata*, *arbor vitæ* (*Thuia* sp.), *arbutus*, Atlas cedar, *aucubas*, beeches (sometimes barked), *berberises* (deciduous and evergreen), Bhotan pine, briars or wild roses (hips excellent food for birds), *cotoneasters*, deciduous cypress, *Deodar* cedar, *deutzias*, *diervillas* (*weigalias*), Douglas fir, English yews, *euonymuses*, flowering currants, *for-sythias*, guelder roses, *hypericums*, ivies, Japan quinces, Lebanon cedar, lilacs, mock oranges, Nordmann's silver fir, Portugal laurels, *Sequoia* (*Wellingtonia*, *gigantea*), sweet briars (hips capital food for birds), Swiss pine, whitethorn (*Cratægus* species and varieties sometimes barked), wild service and *Pyrus* species and varieties generally.

Lightly nibbled or gnawed. Cherries, medlars, pears, and plums (standard trees of a dozen years' growth), younger ones more or less seriously injured. *Abies* (*Picea*) *cephalonica*, *A. concolor*, *A. grandis*, *A. nobilis*, *A. Pinsapo*, blackthorn, *Chamæcyparis* (*Cupressus Lawsoniana* and varieties), *C. nutkænsis* (*Thuyopsis borealis*), *C. (Retinospora) pisifera*, dogwood, *Picea* (*Abies*), *alba* (white spruce), and *P. Menziesii* (*Menzies'* spruce).

Not injured. Alders, *andromedas*, birches, bitter willow, box, Corsican pine, Irish yews, *kalmias*, *periwinkles* (greater and lesser), excellent cover in deep shade, *rhododendrons*, *azaleas* and *spurge laurels*.

The observations refer to shrubs and trees of ordinary planting size up to those of thirteen years' growth from planting. Recently planted suffered most from the hares and rabbits, the degree of

damage being proportionate to the age of the plants, presence, depth and continuance of the snow. Where the snow ranged from 1 to 3 ft. or more in depth, as resulted from drifting, hares had access to the tops of trees 6 to 8 ft. on the snow-drifts, they suffering almost as much damage as trees of 3 to 4 ft. height did where only a few inches of snow was on the ground. Hares always nibble, gnaw, and peel above the snow-line. Rabbits, on the other hand, take up their abode in the "caves" formed by snow overlying evergreens, where they feed on the stems, and on the weather breaking up, acres of cover, such as common laurel, soon become an eyesore. Rabbits, unlike hares, nibbling here and there, clear all their food-plants before them in successional order from their burrows, though travelling considerable distances to secure special food, especially in hard winters and in deep snows continuing more or less, where cover offers, till the snow departs.

WINGED GAME

The COMMON PHEASANT (*Phasianus colchicus*), Fig. 65, belongs to the Rasorial or Gallinaceous Birds, forming the type of the family Phasianidæ (pheasants), which is distinguished by the moderate size and compressed form of the bill, the upper mandible being distinctly arched and overhanging the tip of the lower mandible. The upper mandible is naked at the base, the nostrils are placed at the base of the mandible, and are covered by a scale; the cheeks are naked, and together with the region of the eyes are covered by a reddish skin. The wings are short, the tail is long, wedge-shaped, and consists of eighteen feathers. The three front toes are united by a membrane up to the first joint, and the hind toe is articulated to the tarsus. The male possesses a horny, sharp tarsal spur.

The Common Pheasant was known to the ancient Greeks and Romans. Aristophanes notices it, as also does Aristotle and Athenæus. Jason was reported to have brought it, in the famous ship Argo, from Colchis, the modern Mingrelia, a district situated on the eastern side of the Black Sea. It extends in its distribution over Southern Europe, and is said to even exist in Siberia. It is the *Fasiano* of Italy and the *Faison* of France. To Southern Europe the pheasant was probably introduced by the Greeks or Romans, and thence into Britain, it being very improbable that it was introduced directly from the banks of the Phasis (now the Rion), a river of ancient Colchis. Indeed, the date of the pheasant's introduction into Britain and by whom and from whence is undecided. In Edward I's time (1272-1307) the value of a pheasant was about 4d. of the then currency, now (1908) the price is 5s. 6d. per brace.

The pheasant is a well-known tenant of our woods and thickets,

chiefly terrestrial in habits, and when alarmed takes short rapid flight. The birds are polygamous, the males and females consorting together during the breeding-time, which occurs in spring. The males assemble and feed together during winter, but each selects his bevy of mates in spring. The eggs are olive-brown in colour, and number twelve or fourteen, the simple or rude nest being formed amid long grass or at the base of a bush, the female performing the entire duties of incubation, also care of the young



FIG. 65.—THE COMMON PHEASANT.

birds. The young pheasants are able to run about and provide for themselves on leaving the egg, their food consisting of soft herbage and insects, and as the birds grow, seeds, berries, and roots are added to their dietary. Soon they take to the fields, where they feed upon grain, peas and beans; later in the season acorns and other wild fruits in hedgerows and thickets are laid under contribution, and in winter they obtain a precarious subsistence in woods,

where they perch or roost at night on trees, especially on the spreading, horizontally disposed branches of the larch and spruce, tall holly-trees being esteemed places of refuge. When hard pressed pheasants will visit the poultry yard in quest of food, but this is generally provided against by keepers placing sheaves of corn in woods for the use of the pheasants in winter, and known as "pheasant-feeds," without which it is questionable if pheasants would survive wild in Britain. These "pheasant-feeds," besides enabling pheasants to pass safely over the winter months, encourage flocks of wood pigeons, and though many fall to the keeper's gun, even as many as twenty-six birds on a "train" at a shot, numbers are left to devastate young clover, upon which they mainly subsist, and outstanding tops of turnip and swede crops, as soon as the overlying snow is melted away. From the woods wild pheasants disperse to the outskirts and even hedgerows for nesting in the spring, and are particularly fond of low bushes with long grass at the base, as occurs in young plantations and ornamental coverts, where dry ground obtains with the needful shelter and seclusion for incubation, and also in front or near by open spaces of comparatively short grass and leguminous herbage, upon which the young pheasants may forage and therein find the insect food, such as so-called ant-eggs (pupæ), they require. Sometimes the pheasant—even where no rearing is practised, the preserving being restricted to preventing poaching, keeping down vermin, and feeding in winter—will interbreed with the common fowl, the hybrid produced by the union of the cock-pheasant with the common hen being termed a *Pero*. The pheasant will also interbreed with the Guinea-fowl, and even with the black grouse. When old the female pheasants may assume the general feathers and plumage of the males, and the recorded cases of "cock's eggs" may be explained as the occasional produce of these aged females. There are white and pied varieties of the common pheasant, but these seem never to be propagated. The Ring-necked Pheasant, so named from the presence of a white ring round its neck, is supposed to be hybrid, resulting from the breeding of the common pheasant with the Chinese (*Phasianus torquatus*). The Gold Pheasant (*P. pictus*) of China is a beautiful species, coloured scarlet, blue, and yellow, and with a brilliant erectable crest borne on the head. The Silver Chinese Pheasant (*P. nychthemerus*) possesses a general white plumage, the feathers being marked by fine black lines, and the under-parts are coloured black.

REARED PHEASANTS is a term applied to those brought up by hand. The eggs are collected as laid by the female pheasants, kept in wire-netted enclosures along with a suitable proportion of male birds, and also from nests outside, while many eggs are purchased from pheasant-farm proprietors or dealers. The eggs are incubated by domestic fowls, popularly known as "clucking" hens, and after hatching out the pheasants are fostered by the hens

kept in coops placed in a warm, sunny pasture or grassy place. Here they are carefully fed, tended and protected. In due course the birds pass from the rearing ground to the woods, probably instinctively to secure relative seclusion by day and position for perching at night. In most cases the young birds are "led" to, or even "turned-down" in, certain desirable situations for feeding, roosting and dispersing. Thus hundreds and thousands of young pheasants are relegated from the rearing grounds in August to thickets, plantations and woods in order to acquire a certain degree of wildness, whence they make incursions into fields and naturally feed on the suitable crops therein. The food of pheasants consists of grain, soft herbage, roots and insects; therefore their devastation amongst cultivated crops will be relative to their number, presence of crops upon which they feed, and the hand-feeding practised in order to keep them from obtaining food for themselves.

Wild pheasants—the naturally reared—are so few that they may be said to do little injury to cultivated crops, while they certainly do some good by devouring insects which otherwise would feed upon vegetation.

Hand-reared pheasants, popularly termed "tame," do not materially prejudice agricultural crops where the woods are large and the adjacent land is in grass, so that hand-feeding is imperative; therefore the rearing and preserving of the birds practically affects no one but the proprietor. Where, on the other hand, the preserves are adjacent to fields of rotation grasses, clovers, roots and cereals, there will be damage more or less to the crops, keepers under such circumstances not exercising much care in feeding in the coverts; indeed, the pheasants themselves prefer to roam and forage for the food they require, especially that not supplied in grain-feeding, while keepers favour the straying of pheasants in the late summer and autumn to fields in the respective domains in view of their being found in thick hedgerows, thickets or belts on shooting-days while the trees in woods are in leafage.

On estates, where the shooting is let, the rearing of pheasants often means letting them loose in August to feed on the farmer's grain and other crops. The farmer has derived no benefit from the insect-devouring proclivities of the birds whilst they were young, or only over a very restricted area, of which he often is not tenant, and the only compensating circumstances are relative immunity of the poultry yard and dovecote from preying animals and birds, and is discounted by an increase of devouring rodents.

In pleasure grounds where pheasants are often preserved, and are great ornaments, little harm is done by them, though at times they make great havoc by unearthing bulbs, such as tulips, for feeding upon them, and by scratching and dusting, generally in the wrong place, interfering with the order of well-kept grounds. Even the young birds reared in pens at side of grassy glades and

after leaving the foster-mothers do little mischief to beds and borders, while they certainly keep the grounds remarkably clear of predatory crawling pests.

In vegetable grounds hand-reared pheasants are a plague. The old birds clear rows of sprouting peas and beans, and the "poults" or young pheasants devour all the peas in pod within their "jump-up" reach. Old and young alike have a penchant for green stuff, pecking off the tops of nearly all kinds of cultivated vegetable crops.

The COMMON PARTRIDGE (*Perdix cinerea*), Fig. 66, is a Rasorial bird, forming the type of the sub-family *Perdicinæ*, which in turn forms a division of the main family of the *Tetraonidæ* or grouse. The beak in the partridge is much shortened, and the edges of the mandibles are not indented. The nostrils are protected by a scale. A red stripe destitute of feathers occupies the place of the eyebrows. The hind toes are more or less elevated at the tarsi, which are scaly. The general habitat of partridges is in the comparatively flat pastoral grounds of hilly districts, but they are also found in woody places or amongst rocky cliffs. The nest is usually situated in a hollow of the ground. The progeny is numerous, and the young are able to run about and provide for themselves on leaving the egg.

The Common Partridge chiefly inhabits cultivated fields in Britain. The breeding season takes place in February, the males frequently engaging in combats for the possession of the females. The eggs, numbering ten to fifteen or more, are deposited in a rude nest usually amongst long grass on the outskirts of pleasure grounds, borders of young plantations, and in meadows or under a hedge in pastures at the end of May or beginning of June, the female taking upon herself the whole duties of incubation, although the male, after the young birds are hatched, shares the duties of its mate. The parent birds are very solicitous regarding the welfare of the young, running before the intruder, and by fluttering in an opposite direction strive to distract his attention from the neighbourhood of the nest or young. Instances are on record of the parent partridges successfully engaging a carrion crow in defence of their young. The partridges collect in late summer, autumn and winter in flocks of small size, known as "coveys," but they separate in spring to pair and incubate.

The food of partridges consists chiefly of grass, leguminous herbage, young seeds, and also of insects, and the birds feed in the early morning and late in the evening. The roosting place of the covey is generally in the middle of a grass or stubble field, the birds usually selecting a dry and comparatively high knoll. In the late summer and early autumn the "coveys" are generally found in potato and turnip fields, and in winter resort to furze coverts and similar wild districts.

The RED-LEGGED PARTRIDGE (*Perdix rubra*) is common in some parts of England, especially in Norfolk and neighbouring counties, having been introduced into Suffolk by the Marquis of Hertford and Lord Rendlesham from the continent, where it is common, being found in France, Southern Europe generally, and in Guernsey and Jersey. It inhabits heathy places chiefly, but otherwise closely resembles the common partridge in its habits. The flesh is of a less succulent and tender character than that of the common partridge.



FIG. 66.—THE COMMON PARTRIDGE.

Partridges are far less destructive to farm crops than pheasants, it being a moot question whether they do more good by devouring insects and weed seeds than harm by feeding on grasses, clover, etc. Proclivities for feeding upon grain are no doubt induced by over-preservation, but this feeding is chiefly on stubbles; and though resort may be had to pheasant "feeds," even farmyards and gardens in prolonged severe weather, partridges interfere but little with small holdings, allotments, market gardens, fruit plantations, orchards, and private gardens, these being too much frequented by men to favour partridges.

The COMMON QUAIL (*Coturnix dactylisonans*), Fig. 67, is a Rasorial bird included in the family of the *Perdicinæ* or Partridges. The quail attains a length of about 8 in. The feathers of the head are black, edged with rusty brown. The hinder part of the neck and crown of the head are divided by a long pale yellow line; the breast is of a yellowish-red, spotted with black, the scapulars and feathers of the back are marked with a pale yellow line in their middle, and with ferruginous and blackish bars on their sides.

The Quail arrives in Britain in May and departs southwards in October; the males arrive first and greatly exceed the females in number. The males assist the females in the care and upbringing of the young. The nest is little else than a hole scratched in the ground. From six to eight eggs of an oily green colour are deposited in Britain, six to twelve, or even fourteen, being the number prevailing on the continent. Thus a brood, called a "bevy," in Britain contains six or eight quails. The food consists of herbage, seeds and grains, insects and worms. The flesh is more juicy and delicate than that of the partridge. The London market is supplied with quails chiefly from France. Table quails are principally fed on hemp seed. Quails are very pugnacious, and "quail fights" were indulged in by the ancient Greeks and Romans, just as combats of this nature afford amusement in some parts of modern Italy, the fighting quails being armed with artificial "spurs," after the fashion of fighting cocks.



FIG. 67.—THE COMMON QUAIL.

The CAPERCAILZIE, or COCK OF THE WOOD (*Tetrao urogallus*), Fig. 68, included in the Tetraonidæ, sub-family Tetraoninæ, is the largest species of grouse, about 2 ft. 10 in. in length, and weighing from 9 to 12 lb. The female is about one-third less than the male. In the male the elongated feathers of the throat are black, the rest of the neck and head ashy black, the eyebrows red, the iris clear brown, and the bill nearly 3 in. long, very strong, hooked, and of a whitish horn colour. The wings and shoulders are brown, sprinkled with small black dots; the breast variable green; the belly black with white spots; the rump and flanks black with zigzag lines of an ashy colour; and the tail feathers black, with some white spots near the extremities. The female is striped and spotted with red or bay, black and white, and has the feathers of the head ruddy, those of the breast deep red, and those of the tail ruddy with black stripes.

The nest of the capercaillie is built upon the ground, and contains

from six to ten eggs of a reddish or yellowish brown. The young, when hatched, are fed upon insects. The old birds feed chiefly on vegetable substances, such as the buds and leaves of several trees, and on juniper and bilberries. The capercaillie, once frequent in the British Islands, has practically become extinct as a wild species

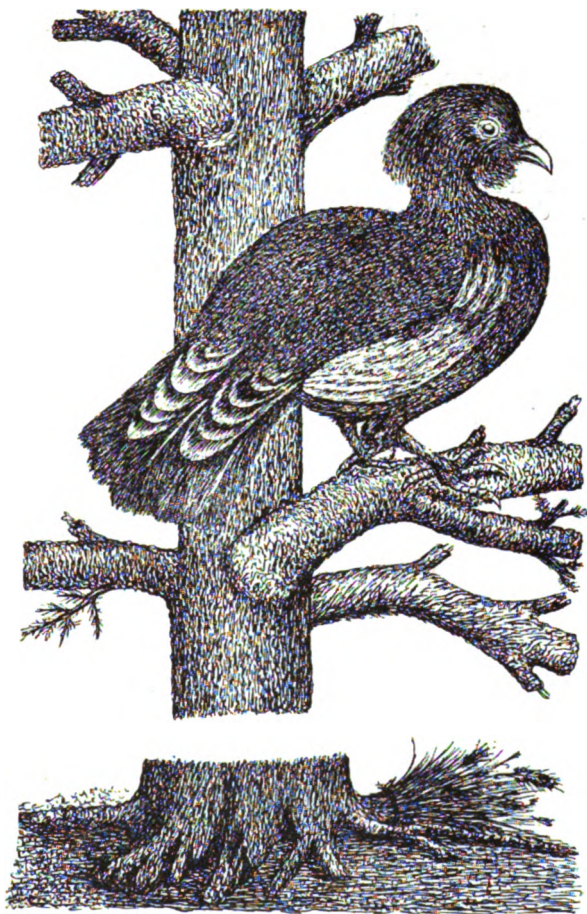


FIG. 68.—THE CAPERCAILZIE, OR COCK OF THE WOOD.

though met with in Scotland ; but though attempts (and successful) have been made to introduce it, the bird forms too tempting, large, and easy mark for the sportsman to be permitted to multiply. It breeds in confinement, and seems capable of semi-domestication similar to the pheasant. It is excellent eating, and may frequently

be seen in the London shops. It lives in pine forests, feeding on the cones of the fir, which at some seasons give an unpleasant flavour to the flesh. Reintroduced from Norway, it prospers where it is well preserved, especially in Scotland.

The BLACK GROUSE or BLACK COCK (*Tetrao tetrix*), Fig. 69, a member of the family Tetraonidæ, is about the size of a common fowl, though it is much heavier, and is distinguished by the male having the outer feathers of the tail curved outwards so that the tail is lyre-shaped. It does not pair, but on the return of spring the males assemble in great numbers, when a contest for superiority ensues, and continues with great bitterness till the vanquished are put to flight. It chiefly lives in high and wooded situations, and is still found on the moors of Scotland, feeding on various kinds of herbage and on berries.



FIG. 69.—THE BLACK GROUSE OR BLACK COCK.

The RED GROUSE (*Lagopus scoticus*), Fig. 70, a member of the Rasorial birds (so named from their scratching habits, and represented by such forms as the fowls, turkeys, pheasants, partridges, grouse, and pigeons) is included in the family Tetraonidæ, the legs being feathered in this genus down to the toes. It is also called moor fowl and is found in great plenty in the Highlands of Scotland, also in Wales, the North of England, Ireland, and the Scottish islands. It pairs in the spring; the female lays eight or ten eggs in a nest formed of heath and grass, carefully heaped together on the ground under the shelter of some low shrub. The young follow the hen the whole summer. The young are fully fledged by August, and when they have attained their full size they unite in flocks of

forty or fifty, and are extremely wild and shy. This bird, as is well known, attracts large numbers of sportsmen every August to the moors to take part in the grand sporting campaign which follows "the twelfth."

The red grouse feeds upon the tender growths of heather and other herbage, and also upon insects. Where moors impinge on moorside farms the grouse acquire the habit of feeding upon leguminous herbage and also upon grain, chiefly in harvest time and in stubbles. Moor-side farmers, however, lodge no serious complaint against the depredations of grouse on their crops.



FIG. 70.—THE RED GROUSE OR MOOR FOWL.

The COMMON PTARMIGAN or WHITE GROUSE (*Lagopus mutus* or *vulgaris*), Fig. 71, has the legs and feet thickly covered with hair-like feathers. It is ash-coloured in summer, but its hue changes to a pure white in winter. The flesh is dark coloured. It is found in most northern regions, such as the north of Scotland, principally among the mountains; but the numbers seen in the London market are chiefly imported from Norway and Sweden. The Ptarmigan's nest is a loosely constructed heap of twigs and grass, and contains from ten to fourteen eggs, of a reddish-white spotted with brown.

The COMMON WILD DUCK or MALLARD (*Anas boschas*), Fig. 72, is included in the family Lamellirostres of the Natatores or Swimming Birds, and in the sub-family Anatidæ or Ducks. It is found both in Europe and America, and is the original stock of the domesticated duck, which appears to have been reclaimed at a very early period. There are few fresh-water lakes and rivers of the British Islands where the wild duck is not found, while it is preserved in several ornamental lakes, and duly attended to in feeding, for affording sport, called "duck shooting." It inhabits the greater part of the northern hemisphere, reaching in winter so far as the Isthmus of Panama in the New World, and in the old being abundant in the

same season in Egypt and India, while in summer it ranges throughout the fur countries, Greenland, Iceland, Lapland, and Siberia. Most of those which fill British markets are no doubt bred in more northern climes, but a considerable proportion of them are yet produced in the British Islands, though not in the numbers that

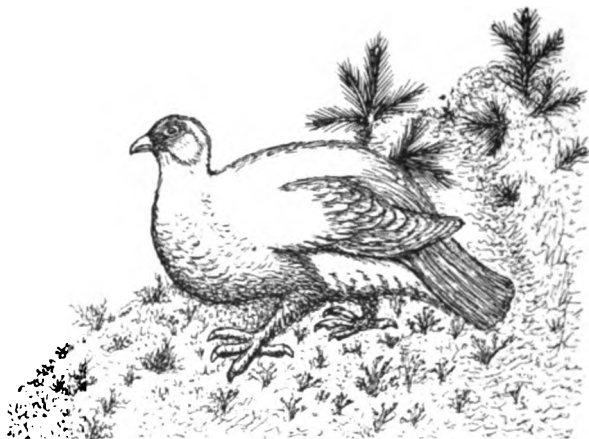


FIG. 71.—THE COMMON PTARMIGAN OR WHITE GROUSE.

used to be supplied before the draining of the great Fen country and other marshy places. The wild duck, however, still flourishes on the Norfolk Broads, and is not as wild as in places where it lives its life without assistance from man.

The Mallard pairs very early in the year, and the couples separate from the flock in search of suitable nesting-places about the first week in March. The nest is usually placed by the side of a stream or lake, or in a marsh or bog, among coarse grass, reeds and rushes; but the spot selected is often very far removed from water, and may be under a furze bush or at the bottom of a thick hedgerow. So soon as incubation begins the mother commences to divest herself of the down which grows thickly beneath the breast feathers, and adds it to the nest furniture, so that the eggs are deeply embedded in this heat-retaining substance, a portion of which she is always careful to pull, as a coverlet, over her treasures when she quits them for food. The nest generally contains from twelve to sixteen eggs, of a dull greenish-white. When all the fertile eggs are hatched, incubation occupying about twenty-five days, the next care of the mother is to get the brood safely to the water, and so cunningly is it done that even when the distance is great, few persons have ever encountered the mother and offspring as they make the dangerous journey.

The wild duck subsists largely on insects and other animal food found in water and on land, rendering good service in keeping down weeds and confervaceous growths in the water, and in scouring the adjoining land for slugs and allied pests. About harvest the young who have survived infant perils from pike and other voracious creatures are able to shift for themselves, and after fattening on the scattered grain of cornfields, they take to the waters again, and are ready for the gun. In Lincolnshire great numbers of these birds were formerly, and are still to some extent, taken in a very ingenious trap, called a decoy, which is a perfect edifice



FIG. 72.—THE COMMON WILD DUCK OR MALLARD.

of poles and nets, and is built in the form of a tube, very wide at the mouth and very narrow at the extremity. The ducks are induced to enter the "pipe" by the antics of a dog, and by some hempseed previously strewn on the water. They are then driven onwards to the smaller end, where they are caught and killed.

Duck shooting on the Norfolk Broads is generally practised by the "decoy," also on some ponds frequented by these birds. Five or six wooden figures—cut and painted so as to represent ducks and sunk by pieces of lead nailed on the bottom so as to float at the usual depth on the surface—are anchored in a favourable position for being raked from a concealment of brush, etc., on shore. The appearance of these usually attracts passing flocks, which alight and are shot down. Sometimes eight or ten of these painted wooden ducks are fixed on a frame in various swimming postures, and secured to the bow of the gunner's skiff, projecting before it in such

a way that the weight of the frame sinks the figures to their proper depth; the skiff is then dressed with sedge or coarse grass, in an artful manner, as low as the water's edge; and under cover of this, which appears like a party of ducks swimming by a small island, the gunner floats down to the very skirt of a whole congregated multitude, and pours in a destructive and repeated fire of shot among them. Sometimes the ducks are stalked from a boat hidden by reeds. In some wild districts, particularly in Scotland, wild ducks may often be shot without these subterfuges, especially when the land rises suddenly to the shores of a lake or loch which the duck frequents. In some salt-water lochs wild duck are numerous, though they are not much good for table; and if one takes a gun, when fishing, one generally gets fair sport during the day when one least expects it.

The COMMON TEAL (*Querquedula crecca*), Fig. 73, is included with the Anatinae or True Ducks and is the smallest of British ducks.

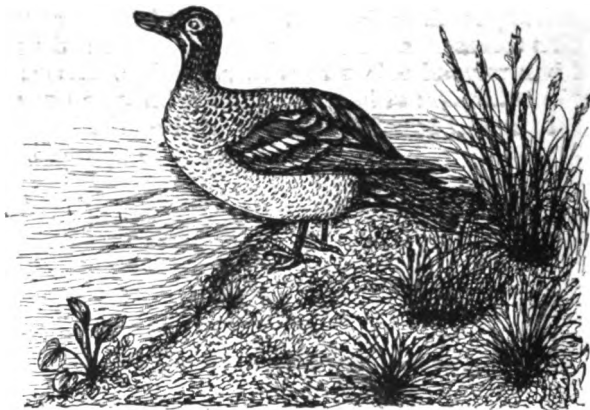


FIG. 73.—THE COMMON TEAL.

The head is coloured chestnut-brown above, the sides being of greenish hue on their upper parts and rich brown below, the two colours being separated by streaks of buff colour. The chin is nearly black; the back is greyish-white, mottled with dark streaks; the wings exhibit brown and purplish hues, and the tail is of a blackish-brown tint. The female is a general sombre brown in colour. The length of these birds is about 15 in.

The teal sometimes breeds in this country, but the greater number fly northwards in summer. It arrives in Britain in September and inhabits lakes and marshes. The nest is built of leaves and grasses, the eggs numbering from eight to ten, and being coloured a dirty or brownish white. The teal feeds mostly in the night, and

its diet mainly consists of aquatic insects, molluscs, etc., varied with vegetation there and also on land, also feeding on slugs and other pests lurking in grass. It also fattens on the scattered grain of cornfields, and is well known for the delicacy of its flesh. Teal ducks are caught in decoys and shot by similar subterfuges, like the mallards.

The WIDGEON (*Mareca Penelope*), Fig. 74, included in the Anatidæ or Ducks, and belonging to the sub-family Anatinae of the True Ducks, is distinguished by the bill being uniformly broad throughout, and the laminae or fringes very prominent. In the males



FIG. 74.—THE WIDGEON.

the head and neck are rich chestnut in colour, with the exception of a yellowish cream colour band passing from the forehead over the crown; the breast is pale red, and the under-parts white; back is greyish-white, with irregular black lines; primaries dusky brown, speculum glossy green, and the tail nearly black. The average length is about 20 in. The female is less brightly coloured than the male, being ruddy brown on the head and neck, with darker markings, the back being brown and the abdomen white. The male loses his brilliant colours after the breeding season.

The widgeons arrive in Britain from the north in September or October and then assemble in large flocks. They migrate northward in March and April, and appear to pass the summer for breeding purposes in Norway and Sweden. The nest is usually composed of decayed grass, leaves, or rushes, lined with the soft feathers plucked from the breast of the parent bird, and is placed near water, usually among the substances of which it is composed. As the flesh of the widgeon is very delicate, the bird feeding almost exclusively on a vegetable diet, it is much sought after for the table.

Part II

INFLUENCES

IN the preceding pages the principal vertebrate animal friends and foes of the sportsman, the fisherman, the forester, the farmer, and the gardener have been treated of; therefore we now take up the threads of the subjects and proceed to notice the influences that the creatures referred to exert for or against the respective pursuits, together with the preservative or repressive measures all-important for their success conjointly, without undue hamper and hindrance to the several co-relative vocations, and in mitigation of the great heart-and-pocket-burnings reflecting discredit, and inconsistent with the interests of the whole.

CHAPTER VI

WILD ANIMALS

INSECTIVOROUS AND HARMLESS

BATS. The influence the family Cheiroptera or bats exert is an altogether beneficial one, their importance being apparent when it is stated that there are fifteen or sixteen different species found in Britain, and that they are all more or less feeders on insects which are not friends to any of the animal and vegetable produce crops. Everywhere the bats emerge from their winter quarters contemporaneous with the insect hosts in spring, and are seen hawking for flies and various insects about woods, over waters, round farmsteads, along lanes and streets, some bent on coleopterous pests, others on dipterous insects, and others again preying on the nocturnal Lepidoptera, while others yet again give particular attention to gnats and insects found in low-lying situations. Truly the bats are friends of all useful crops.

SHREWS. The Soricidæ, feeding chiefly on insects and their larvæ, some on land and others on water, must be regarded as inno-

cuous and never likely to become injurious to vegetation on account of the annual decimation that occurs in their ranks by agents as

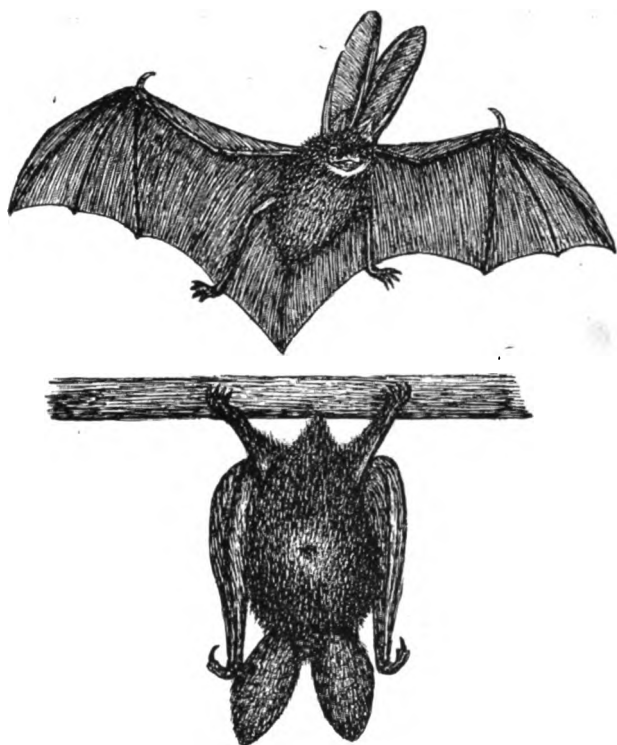


FIG. 75.—THE LONG-EARED BAT FLYING (UPPER FIGURE), THE SAME HANGING (LOWER FIGURE).

yet undetermined, though the owls, particularly the little owl (*Athene passerina*), kills shrews.

USEFUL AND PARTLY INJURIOUS

BADGER. This mammiferous quadruped of the plantigrade tribe must be considered too uncommon to inflict serious damage upon the sportsman's or the poultry-farmer's interests. Game-keepers and dog-fanciers, the first for the havoc it makes among young ground and winged game, and the latter for affording cruel sport, never lose opportunity of killing or capturing the badger; therefore it is not likely to become so greatly multiplied as to cause much injury to crops. Indeed, the more likely outcome of its

hunting, its den being betrayed by the strong smell, is the extinction of this, on the whole, harmless creature.

HEDGEHOG. Nocturnal or crepuscular in habit, little is seen of this quadruped, except in the long summer evenings and in the

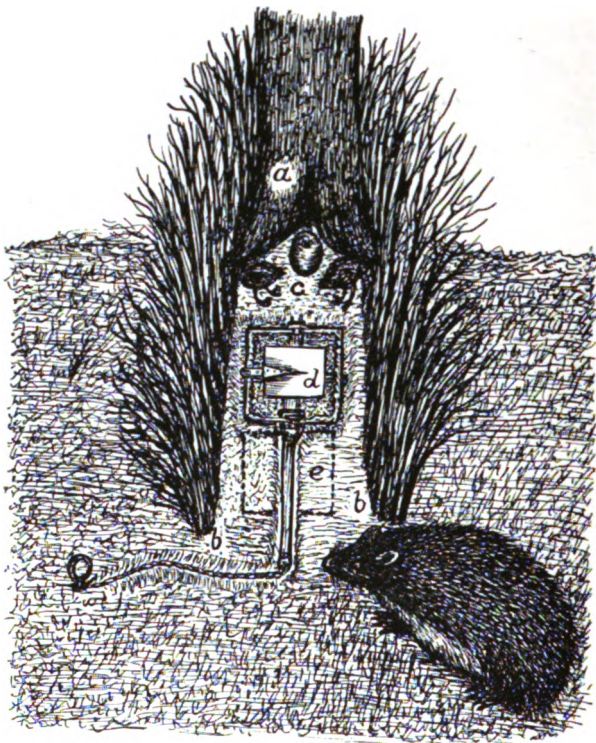


FIG. 76.—TRAPPING THE HEDGEHOG.

References : *a*, butt of tree (a wall, board fence, or other close back answers) ; *b*, stick or thorns thrust well into the ground and standing a foot or more above ground so as to form a narrow (7 or 8 in. wide) passage from tree or back quite close and extending about 18 in. outwards ; *c*, bait (egg with hole in shell, or recently dead chick) ; *d*, trap, uncovered and wrongly placed, as the animal may tread on spring and strike trap, thus escaping capture ; *e*, proper place for table or mouth of trap, the spring being towards *c* and also the peg to which chain of trap is secured, so that the animal is caught on entering passage, the trap being concealed by covering with earth lightly and evenly so as to resemble surface of ground, and strike promptly and effectively when table is trod upon by animal.

early dawn. Its usual food consists of large insects, worms, slugs and snails, also mice and voles, particularly their young. It is of great service to the forester, and beneficial to the farmer and gardener by devouring noxious insects and various small vermin. But the hedgehog also eats roots and other vegetable substances, even fruit, fallen or within reach, such as Morello cherries low down

against a wall, so that its work is not compatible with high culture in either the field or garden. In fields under ordinary crops and in pleasure grounds, its good influence is unquestionable; also in woodlands, coppices, hedgerows, and rough places generally, often the breeding grounds of noxious pests and from whence infections of useful crops often proceed and extend over wide areas.

Against the virtues, including that of being very good to eat, of the hedgehog must be placed the very grave faults of egg-stealing and killing the young of ground-breeding wild birds, this applying to both game and poultry. The gamekeeper and the poultry farmer accordingly consider the hedgehog as "vermin" and act so as to prevent its depredations or recurrence of them by trapping. This is generally effected by means of ordinary steel spring traps, an egg or a recently hatched dead game or poultry chick being used as a bait and so placed that the prickly intruder must pass on to the trap, duly concealed and affixed by cord or chain to a peg driven into the ground or to some fixed object (Fig. 76). In the case of a particular individual paying repeated visits to a particular place, a run or track may be discernible, when two or three traps set therein and about the place will secure the intruder.

MOLE. The natural enemies of the mole are now so few in number that once a colony of moles becomes established in any locality the occupier of the land has to consider whether the work of the subterranean creature is useful or injurious to the crops. The sportsman has good reason to complain of mole-hills on glades and drives in woods, also alongside of coverts, as a cause of stumbling, the soft and hollow ground impeding the hunter's "mount" speedy and safe gallop. To game, the mole is innocuous; but, by devouring ground pests it may deprive winged game of some insect food, while in itself affording some of the fox's dietary. The forester suffers in the nursery from the disrooting, upheaval, and covering up of seedling plants, but in woods and plantations the mole does practically no harm other than blocking ditches more or less, thus necessitating scouring periodically in return for the great benefit conferred by the destruction of ground root-destroying pests. On commons and moors, even grazed hill pastures, the mole may be regarded as a blessing rather than as a curse. The farmer is affected by the mole in two ways: first by the food it eats, and secondly, by the work it carries on to obtain that food. The food largely consists of the earthworm, which, like the mole, tunnels in the ground and casts up earth that has passed through its body and surface-dresses the vegetation with vegetable mould, while by its borings through the soil air and water is let into the ground and a sort of tillage effected. The mole also feeds largely on insect larvæ, particularly grubs, notably wireworm. On the other hand, by driving its tunnels in all directions it lets the air into the soil, and throws up loose soil on the surface in the form of mole-hills, thus acting much

after the manner of the earthworm in tilling and surface-dressing the ground. In tunnelling the mole cuts the tender and actively feeding roots, and the hills frustrate effective grass-cutting by either the scythe or grass-mower. In winter and spring the greater part of mole-hills are thrown up, hence, if the mounds are spread just before the field is "shut up" for hay, followed by chain or bush harrows and roller, not much further throwing up of hillocks takes place, as the mole works near the surface, and betakes itself to hedge-banks or outskirts of coppices and woods for breeding, and there forms the large mounds so objectionable in meadows. Though the mole prefers to work in grass fields, it invades arable land; and among winter wheat, oats, and beans, also rotation grasses and clovers, is very annoying, making its surface runs and hillocks in all directions, and by up-rooting and covering over of the young plants, is prejudicial.

But by the time barley is sown in spring or the wheat has been hoed, the mole's activity will have abated and few hillocks remain to incommode the reaping machine in harvest. Nevertheless, the mole's feeding runs are mainly trenches just beneath the surface, and when these are considerable, the plants suffer seriously, particularly in light soils. The runs are often made in potato and root crop ridges, and for this reason moles are not tolerable in cultivated land during the cropping season. In the garden the mole is particularly energetic in tunnelling through lawns, flower beds and borders, while in vegetable grounds the trouble, annoyance and damage to plants caused by the tunnels and cuttings and soil upheavals soon convince the most kindly owner or occupier that the garden is no place for the mole either as pleasure or profit. This applies to all outdoor crops of the horticulturist; indeed, in all highly cultivated land, the mole is an intolerable nuisance, hence recourse must be had to trapping.

THE COMMON WOOD MOLE TRAPS, as used by professional mole catchers from time immemorial, are shown in the illustration, Fig. 77. The Tube Trap *A* is formed of lime, sycamore or willow, $5\frac{1}{4}$ in. long, $2\frac{3}{4}$ in. diameter, 2-in. bore (*f*), piece cut out of lower side to admit of adjusting table (*g*), $\frac{1}{2}$ -in. hole bored in centre of upper side where $\frac{1}{2}$ -in. thick (*h*), $\frac{1}{4}$ -in. holes at each end for snares (*i*). The other parts are identical with those described under *B*, the tube trap being shown set, main string (*j*) secured by forked piece and tube by pegs (*k*), with the spring stake (*l*) adjusted.

THE COMMON WOOD BOW MOLE TRAP, Fig. 77, *B*, consists of a piece of half-inch board, $5\frac{1}{4}$ in. long by $2\frac{3}{8}$ in. wide, through which four holes are bored in the four corners and one in the middle. A piece of $\frac{1}{2}$ in. hoop-pole is split, the ends pointed a little, and so bent flat side inwards as to form bows, when fitted in the end holes, about 2 in. deep, then appearing as the two pieces (*m*). Another forked piece of the same material (both preferably hazel), but unsplit, is cut, and rounded at the straight end, so as to fit in the

centre hole of the main part of the trap (*u*). A hole is then bored at each end midway of the bows (*o*) to admit the snares, which are formed of fine brass wires double or triple twisted, and long enough to reach from the string above the hole round the inside of the loop. A piece of whipcord (*s*) exclusive of the loop and knot

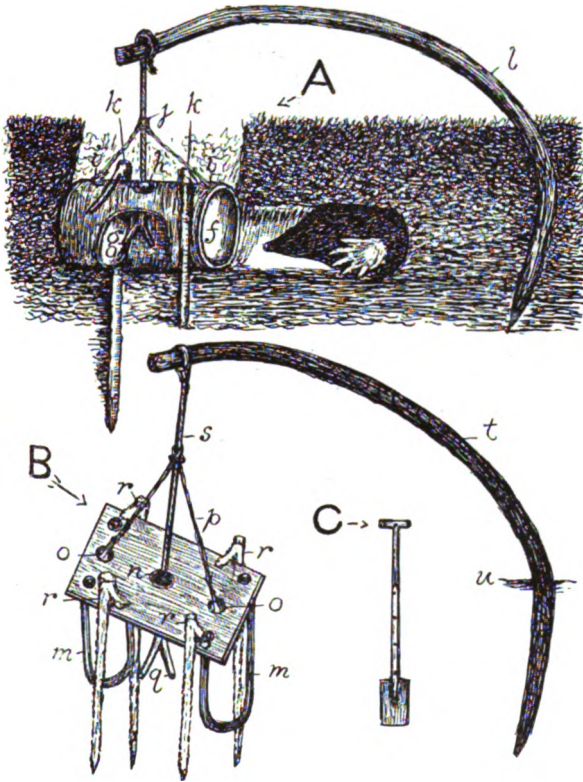


FIG. 77.—THE COMMON WOOD MOLE TRAPS.

A, tube trap: *j*, tube 2 in. bore; *g*, forked piece or table; *h*, catch-string hole; *i*, snare holes; *j*, main string; *k*, pegs to secure trap in position; *l*, stake spring. *B*, board top trap, the form most approved by mole catchers: *m*, bows; *n*, main string aperture; *o*, snare holes; *p*, snare strings (slack); *q*, table; *r*, peg to secure trap in position; *s*, main string (tight); *t*, spring stake; *u*, ground level. *C*, small spade, commonly called mole-trapper's spade.

at the other end, has affixed to it two pieces of similar cord about 3 in. long and that distance from the knot, and to the ends of these the snares are secured. For this trap four pegs (*r*) are required, and also a spring stake (usually hazel) about the thickness of the thumb, and a small spade *C* for taking out the soil to set the trap.

The KENT GARDEN TUBE and BOARD-TOP MOLE TRAPS, Fig. 78, combine the advantages of the common wooden ones with the substitution of a steel spring for the ordinary spring stake, and dispensing with pegs; otherwise the construction is the same.

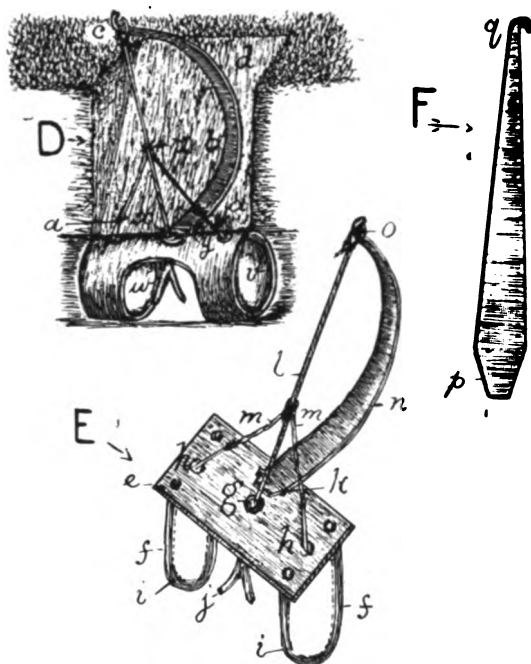


FIG. 78.—THE KENT GARDEN TUBE AND BOARD-TOP MOLE TRAPS.

D, tube trap: *v*, tube; *w*, forked piece or table; *x*, table and spring string-hole; *y*, flat eye to receive lower end of spring; *z*, knot on main string where snare strings secured; *a*, point where wire snares affixed to snare-strings; *b*, steel spring; *c*, loop of main string affixed on hook of spring, thus the main string held by table is tight and the snare strings slack so as not to disturb wire snares inside tube; *d*, slope made in soil so as to admit spring of trap. *E*, board-top trap: *e*, $\frac{1}{4}$ in. board, preferably hardwood; *f*, bows; *g*, main string and table hole; *h*, snare holes; *i*, wires placed inside bows; *j*, forked piece or table; *k*, flat eye for spring; *l*, main string (tight); *m*, snare strings (slack); *n*, steel spring; *o*, loop of main string passed over hook of spring. *F*, detached spring: *p*, wedge end; *q*, hook end.

The KENT GARDEN TUBE MOLE TRAP, Fig. 78, *D*, is constructed the same as the Common Tube one, Fig. 77, *A*, but has an eye at *y* to admit the steel spring. The Kent Garden Board-top Mole trap, Fig. 78, *E*, is made like the Common Board-top one, Fig. 77, *B*, but has a flat eye, *k*, formed of galvanized wire (ends clenched on under-side) to receive the lower end of the spring about $\frac{1}{4}$ -in., the eye 1 in. wide inside. The spring *F* is formed of $\frac{1}{8}$ -in. steel plate and the shape shown; scale $\frac{1}{4}$ in. equals 1 in., formed to fit the eye of the trap at the lower end *p*, with a hook at the small end *q*.

The trap, whatever the form, is set in a run of the mole, taking care to disturb the run only enough to allow the tube or loops (Fig. 77, *B m*) to enter it. To set this trap (the directions applying to the other forms), the wires are passed through the holes (*o*), opened out and led along inside the wooden loops and kept in position by a little moist earth pressed down with the thumb; then the knot of whipcord is placed through the centre (*n*) and the forked piece (*q*) thrust upwards rather tightly so as to wedge the string with the knot just below the board, and, in the case of the spring being a stick, the four pegs (*r*) thrust in at the respective corners so as to keep the trap in place against the upward force of the bent stake. This (*t*) is thrust into the ground (*u*) at such distance that when bent over the trap, its end, where the whipcord loop is passed over, will be as nearly as possible perpendicular over the middle of the trap. In setting the Kent steel spring trap the main string loop has only to be placed over the hook of the spring after adjusting the snares and table, and then merely requires placing firmly in the mole run. If the run be deep, it will be necessary to take out a channel in the soil so as to admit the spring of the Kent trap. In either case the central string (*s*) will be tight, but the snare ones (*p*) slack, when the trap is set. A little grass or bits of turf will need to be disposed on the trap to exclude daylight, using soil if necessary, yet keeping the space beneath the trap clear, and so as not to interfere with the action of any part. A mole passing through the run has to go through the loops, and in its passage displaces the forked stick or table, when the main string is forced upward by the spring drawing up, and at the same time the snare strings, between the wires of which and the board the mole is caught.

The chief art in setting a mole trap consists in choosing the run. In soft ground a mole makes numerous runs just beneath the surface, and in such soil would as soon make a new run as use an old one; but moles generally have main runs between their hunting-grounds (soft and moist soils) and nesting-places (banks and dry ground), hence trapping in these or in runs through hard ground proves most satisfactory. When a run is near the surface, as frequently occurs in hard ground under an inch or two of comparatively loose soil, the mole sometimes avoids a trap by passing on one side; in such case tread the run in crosswise, when the mole will make a new one through the firm soil, and a trap carefully set therein will usually prove successful.

Be careful not to use elder for the fork or table of the trap or anything in connection with it, otherwise the mole will pass alongside, under, or turn back to avoid the trap.

The Kent garden tube trap (Fig. 78, *D*), besides acting as an effective mole trap, can be used at the mouth of rat-holes, even in buildings, by placing it between two bricks, within holes in the ground and even in over-ground runs, for capturing rats and other vermin:

Small size, 1 in. diameter, traps of this pattern, with spring of lesser strength, are excellent for catching field-voles, either by placing in their mossy runs, or at entrances to ground holes, also for capturing field-mice.

The Kent board-top steel spring mole trap (Fig. 78, E) may be set at the mouth of rat-holes in the ground without exciting suspicion, a little soil being taken out so as to admit the trap level with the entrance, and in operation is humane, as are all the forms configured, the animal caught being quickly strangled.

Similar traps to the Kent with steel upward springs are the Climax Mole Trap (after fashion of the board-top), Wood-board Mole Trap (after the style of the tube), and the New Patent Self-acting Mole Trap (tunnel fashion with open bottom), respectively 7s., 10s., and 12s. per dozen, supplied by Wm. Burgess & Co., Malvern Wells, Worcestershire, and possess its advantages pre-eminently.

Cast-iron and galvanized iron mole traps of "crab-claw" pattern,¹ procurable of ironmongers, prove more or less successful for capturing moles. The improved double spring Fast-setter Mole Trap (Fig. 79) is self-setting, and most suitable for deep runs, very reliable and moderate price (5s. 6d. per dozen), also supplied by Messrs. Wm. Burgess & Co.

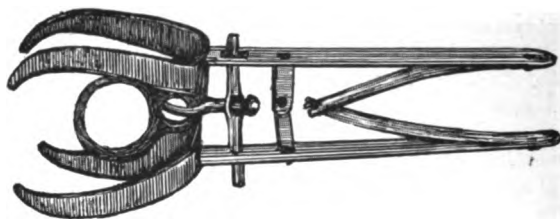


FIG. 79.—IMPROVED DOUBLE SPRING FAST-SETTER MOLE TRAP.

Moles have a decided objection to the smell of the green leaves of the common elder (*Sambucus nigra*), therefore the very old practice of placing little bundles of these in the mole runs effectively drives moles from the place. A more drastic measure is sometimes employed, that of putting in their paths worms which have been placed in a vessel containing a small quantity of carbonate of barytes (a poison).

WEASEL. This little animal must be regarded as an enemy of the game-preserver and the poultry-keeper, inasmuch as its smallness is made up for by its savage and active masterliness over young rabbits, leverets, and chicks of both winged game and poultry, also dove-cote. In the case of game coverts, rabbit burrows or warrens, breeding coops and dove-cotes, the weasel is an incorrigible

¹ "Model" and "Simplex." Mr. H. Lane, Eagle Works, Wednesfield, Staffordshire.

offender and must be destroyed if the subjects are to thrive. On the other hand, the weasel is the most deadly foe the small rodents, mice and field-voles, also young rats, have, hence the forester, the farmer (excepting his poultry and pigeons), and the gardener acclaim for its protection as doing little damage to game, while conferring much benefit as a persistent mouse-hunter and mole destroyer, particularly on moorlands and hill pastures. Albeit, the weasel, like every other creature, will make its way from wild

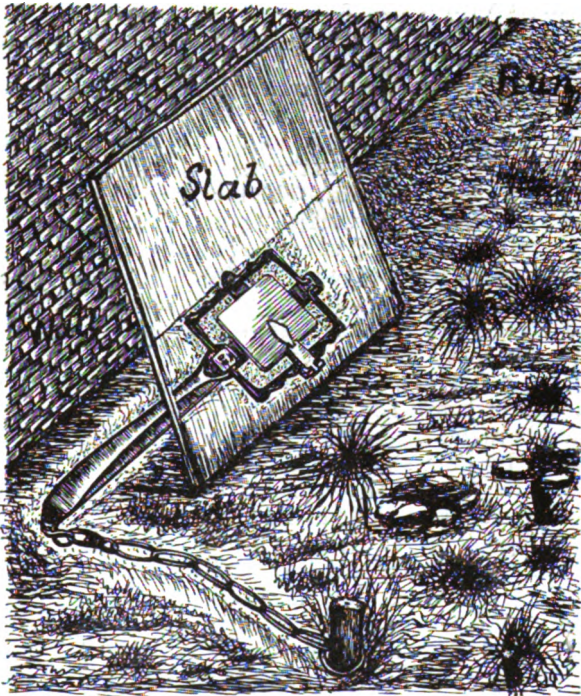


FIG. 80—SMALL DORSET VERMIN TRAP SET FOR WEASEL.

nature to cultivated tracts and there follow its blood-sucking propensities, so that the person against whose interests it militates must take repressive measures in order to attain success in his occupation.

Trapping in the case of game-preservers and poultry-farmers, also rabbit-warreners, is imperative. The trap usually employed for capturing the weasel is the Small Run Vermin Trap with grooved 3-in. jaws, strong reliable spring and chain complete, 16s. per dozen. Some vermin-trappers prefer the Small Dorset Vermin

Trap, 3 in., bevelled spring, brass catch, and loop chain complete, 30s. per dozen. This trap, Fig. 80, may be set after the manner shown in Fig. 76, baited with a freshly killed small rabbit in place of the egg or chick bait as advised for the hedgehog (this animal being most attracted by a dead rabbit when kept till it is decidedly high), some trappers disembowelling the bait-rabbit and opening out the belly part so as to expose the kidneys and placing so as to face the trap at the back of the improvised run. The trap in this case is covered with fine soil by means of the "sifter," a box-like implement with a screen at bottom and a handle to operate with, and acts equally well against poaching cats as the weasel family, also the hedgehog.

Weasels are generally most active during the early spring months before the hedges are in full leaf, and at this time it is more easy to catch them in traps. They often hunt in couples, and after the young are grown up as many as five or six will join in the chase of a rabbit, which rarely escapes. The bottom of a hedge or that of a small dry ditch is a favourite "road," and among buildings weasels always travel along just at the foot of the walls or anything that will give them temporary shelter from observation. Success, therefore, in trapping depends largely upon finding out these likely roads, and there setting *Small Run Vermin Traps*, preferably by placing two flat tiles inverted v or ridge fashion over an open run, or setting up a flat tile, stone, or old slab in a slanting position against a wall or board fence, these tempting vermin coming that way to pass between them and on the trap, while this is not likely to be sprung by domestic animals.

The best way to take the weasel and stoat, also polecat, is to make false drains where three or four hedges meet, get four 4-in. drain-pipes, dig out the earth enough to cover them, and leave the surface level. Cover the pipes as in draining, make several branch runs by nicking out the earth with a spade, all leading to the mouth of the drain. Place a small Run Trap as far in the drain as you can reach to peg it down. By the side of a ditch or brook is a good locality for placing these traps, no covering or bait being required.

DESTRUCTIVE

Fox. In the hunting shires of England and Wales there are about 170 foxhound packs containing 6,400 couples of hounds; in Scotland, 11 packs, with 358 couples; and in Ireland, 24 packs, with 1,042 couples, testifying to the great favouritism of *Reynard* for affording sport, his cunning and trickery being so notorious that, notwithstanding his many faults, he has always been tolerated and even treated with favour by the northern races, being sacred to the mighty Thor, whose red, flaming beard was of the same typical colour. Nevertheless, in the mountain districts of the British Islands,

where no hound or horseman ever comes, cultivators will not tolerate his too-frequent depredations in the sheep-fold and poultry-yard, among winged and ground game, being oblivious to his decimation of rats, mice, moles, and voles. Unfortunately, the fox, knowing as he is, has not the capacity to discriminate between wild and domesticated animals, therefore helps himself to the readiest and best food "come-at-able," unfortunately killing more than suffices for present needs. To the game preserver not interested in fox-hunting the fox is an unmitigated culprit of the worst type, and by the farmer deriving no benefit from the sport of fox-hunting no quarter is given to reynard, but every possible obstacle, such as barbed wire and spiked hurdles used for fencing and mending gaps in hedges, placed in the way of the hunter. This is often mere "cussedness" and akin to that of the fox in destroying a score of young or grown-up chickens when one would have served for a meal, inasmuch as the prompting is that of extreme selfishness, and practised regardless of another's pleasure and profit. Nothing is seen but damage done by fox-hunters in galloping across fields and breaking fences, and depredations of foxes among poultry, total eclipse of trim, neatly-cut hedges of half a century ago obscuring fences now full of gaps and repaired in the most casual way with dead thorns, or a few yards of barbed wire, while oblivious to there being no sort of poultry-house on the farmstead, the hens nesting anywhere, all over the place, and at night roosting in cart hovels, implement sheds, and other buildings.

On the other hand, the sportsman—the fox-hunter as distinguished from the game-preserver—makes matters clearly understood by gamekeeper and farmer in respect of both game and poultry, namely, that while game is preserved and poultry-farming practised, foxes must also be protected on his domain. This is consonant with experience as regards mutual advantages. 1. If no foxes, no hunting, and no need for horses bred for that purpose; no necessity for selected oats, hay, and straw, no hard cash distributed in a hunting country in wages, in up-keep of stables, kennels, and mounts in respect of saddlers, tailors, medical and veterinary surgeons, hunt breakfasts, luncheons, suppers, balls, etc., even "meets" implying lavish expenditure. 2. If no foxes, game unduly preserved and without restriction, in many cases beyond reason, so as to hamper and hinder the farmer in his vocation, and raising up a spirit of animosity and contention so expressed as to desire total abolition of the Game Laws. 3. If no foxes, no necessity for protective wire enclosures to breeding-grounds and poultry-farms, no need for owners and occupiers to provide suitable and roomy yards and shelters where the poultry can be locked in at night. All these point to the enormous amount of money which changes hands through the national sport of fox-hunting, and

goes in one way or other to benefit agriculture and the country, even the game-preserver and poultry-farmer, inasmuch as these industries must be pursued on cultural lines and not on out-of-date practices.

But fox-breeding must be excluded from the category of utility to fox-hunters, game-preservers, and farmers when it is carried on so as to preclude partridge shooting and the rearing of poultry profitably, as was the case in Mid-Essex in 1906. At Leigh, midway between Braintree and Chelmsford, an Essex hunt established a breeding-ground for foxes upon eighteen acres of land hired from the governors of Guy's Hospital, and here the foxes increased at an abnormal rate, the object being to provide animals in this enclosure to give sport for different hunting packs in the country. The foxes lived there all through the year undisturbed, and those placing them there not having provided means for their sustenance, the foxes soon proved a scourge in the district. On Mr. J. Badley's estate, one of the largest in Essex, and whose land adjoins the haunt of the foxes, partridges became extinct; consequently no shooting for himself and friends in September, a serious matter as regards food to the nation and expenditure in entertaining. Besides, while there was scarcely a head of game to be found within half a dozen miles of the den, the farmer's stocks decreased enormously. One farmer at Leigh, who holds 300 acres of land, had taken a hundred poultry and ducks in a single morning from his yard, and over the whole of his land partridges, of which a good reserve was left in 1905, had become extinct. The foxes attacked the farmer's stock in the daylight, which had not occurred before; therefore it was necessary to have a man on guard in the farm-yard all day in order to drive the foxes away. Daylight depredations of foxes in the poultry-yard when vixens have families dependent upon them are not uncommon even in the case of wild foxes, which incursions might be effectually prevented if those having charge would supply the vixen during the time the cubs are with her with a few rabbits and rooks left conveniently near her earth.

Tame foxes must be classed with tame deer for chasing purposes, and as repulsive to humane feeling as rabbit coursing; while the game-preserver and the poultry-farmer are justified in reprisals on tame foxes, or an undue number of these animals in the vicinity of winged game and poultry-rearing fields, the proprietors of these taking the necessary precautions against ordinary incursions.

In the rearing fields a boundary of low netting is of little avail against foxes, nothing less than 6 feet high wire netting sufficing, and this turned out at the top at an obtuse angle, with closely barbed wire stretched about 6 inches above the bent-over netting. This is expensive (2s. 6d. per yard run), therefore recourse in

most cases is had to expedients, such as strings of twine affixed to stakes at a height of from 9 to 18 in. from the ground, and these lines dressed at intervals of a few days with gas tar, "verminite" (supplied by Messrs. Wm. Burgess & Co., Malvern Wells), or "reynardine," the three lines being about a yard apart, the outer one 9 in. high, middle 1 ft., and inner 18 in., and this a yard from the usual wire-netting, along the top of which is run a line smeared with the offensive substance. In addition to this protection to the rearing ground, a hurricane lamp at the corners of the ground, and each fifty yards distance along the sides and ends, lighted at dusk and kept alight until dawn, is found effective in keeping foxes at bay. To prevent foxes disturbing sitting birds a little of an offensive substance, such as "verminite," scattered on the twigs and round the nest has been found effective, not only against foxes, but also poaching cats and straying dogs.

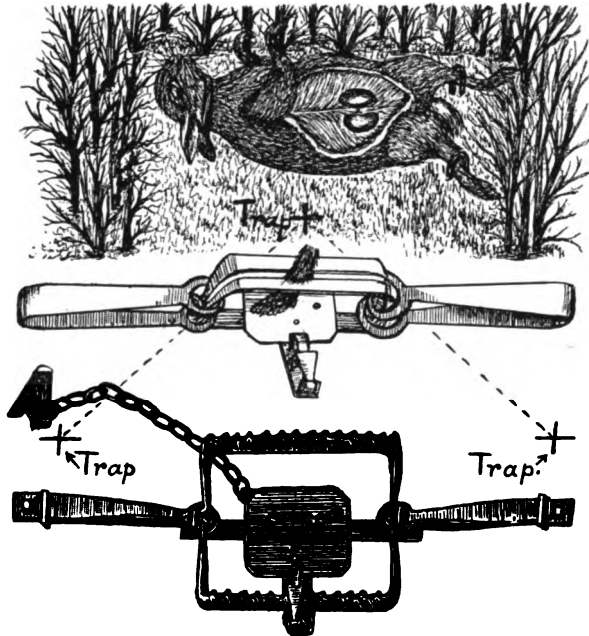


FIG. 81.—FOX TRAPS, AMERICAN PATTERNS.
(Supplied by Mr. H. LANE, Eagle Works, Wednesfield, Staffordshire.)

In places where no hound or horseman ever comes and there is no need for the fox, shooting or trapping is had recourse to. The trap employed is usually a double spring, either with plain jaws (Fig. 81), or with teeth, and with spikes, and with either round

R.N.

K

or square jaws. The sizes range from 6 in. (by inch increase) to 12 in. jaws. The trap may be set in front of a bait, such as a disembowelled rabbit, with a close passage opening only on to the trap, which in the smaller sizes is not usually baited on the table, while the larger ones generally are, so that the animal is taken by the head, and by teeth and spikes quickly dispatched. Of course, trapping can be effected at the mouths of earths, or the entrances in rocks or cliffs, the trap in all cases being concealed, only the bait being visible. A new trap must not only be hidden but "faked" in some manner to counteract suspicion. The mere fact that bait is used is not of itself sufficient, precaution must be taken to dull the newness of the steel or assimilate its appearance to its surroundings when set by rubbing it with mud, clay, or by artfully concealing its presence with grass, leaves, or with whatever the trapper's experience and knowledge teaches him to be best suited for such a purpose. In setting a steel trap the careful trapper generally wears gloves, in order to avoid the possibility of any human scent being left on the trap, material with which it is concealed, or on the ground, grass, or twigs in its vicinity.

MARTEN. This member of the weasel family can only be said to be useful in keeping down squirrels, and when descended to the ground preying upon mice, rats, and voles, all enemies of the forester's and gardener's cultures, also favouring those of the farmer in respect of vegetable crops. But the marten's depredations on winged and ground game, also in the poultry-yard, are so pronounced that neither the game-preserver nor poultry-farmer loses opportunity of effecting its destruction.

POLECAT. The ravages this animal commits in game-preserves, winged and ground game alike falling victims to its rapacity, and in the farmyard by killing far more victims than it can eat, sparing neither fowls and ducks, nor geese and turkeys, or pigeons and tame rabbits, provokes such repression that it is a rare creature. The game-preserver, poultry-farmer, rabbit-warrener, and pigeon-breeder has no use for the polecat, save that it destroys rats and mice; but its ravages on domesticated and animal food-supplying wild denizens of the woods and fields altogether outweigh any advantage in those respects. Only in districts not highly stocked with game, and where there are no poultry-yards, has the polecat tolerance as a destroyer of mice, rats, moles and voles; but from the forest and hilly districts and moorlands, where the foulmart or fitch is a blessing to the forester and grazier, incursions are made to preserves and poultry-yards.

STOAT. Although smaller than the polecat, the stoat is very swift and active, cunning and cruel, usually contenting itself by sucking the blood of its prey. It is so active that it requires a smart dog to catch it, and will fight vigorously till killed, trying to fix the dog by the nose with its teeth. It is difficult to kill, often getting

away when hit hard with shot. Destructive to game, especially ground game and poultry, it is vermin to the game-preserver and poultry-farmer, while to the forester, grazier, and gardener it is regarded as among the deadliest and most persevering enemies of small rodents. Albeit, the stoat's visits to a henroost and dove-cote entirely transforms the friend into the enemy, and the opinion of doing quite as much good as harm changes to doing some good, but not nearly sufficient to counteract the harm.

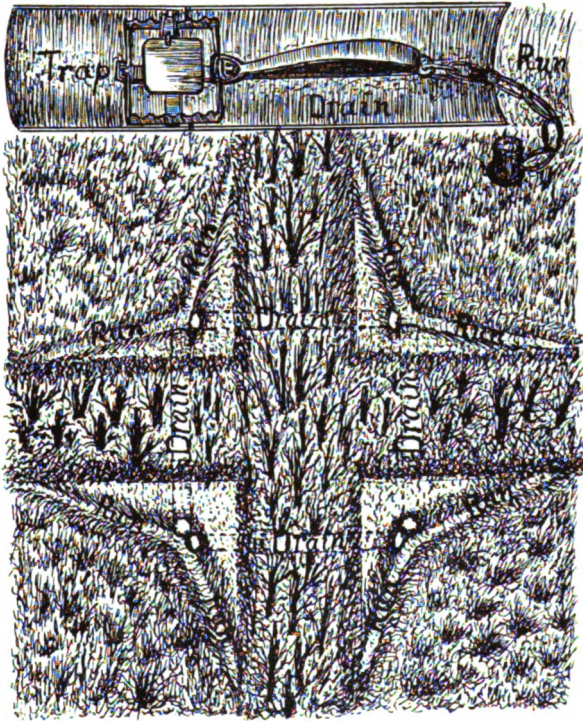


FIG. 82.—RUN-TRAP IN IMPROVED DRAINS.

The best way to take the polecat and stoat is to make false drains as described under weasel, using a Run-trap, Fig. 82, supplied by Mr. H. Lane, Eagle Works, Wednesfield, Staffordshire, with $2\frac{1}{2}$ in. or 3 in. jaws. By the side of a brook or ditch is a good locality for placing these traps, no covering or bait being required. As both the polecat and stoat take up their abode in holes in rocks or an old burrow, traps should be set at the mouth, or so far in as can be reached to peg the trap down. This will

prevent foxes from getting foot in the trap, though from the smallness of the jaw of run-traps foxes are insured against serious injury should they spring the trap, even the *Small Dorset Vermin Trap*, which, though designed for the capture of stoats, weasels, etc., is largely in demand for rabbit catching in fox-hunting districts. This trap (supplied by Mr. H. Lane) has 3 in. jaws, and is fitted with brass catches.

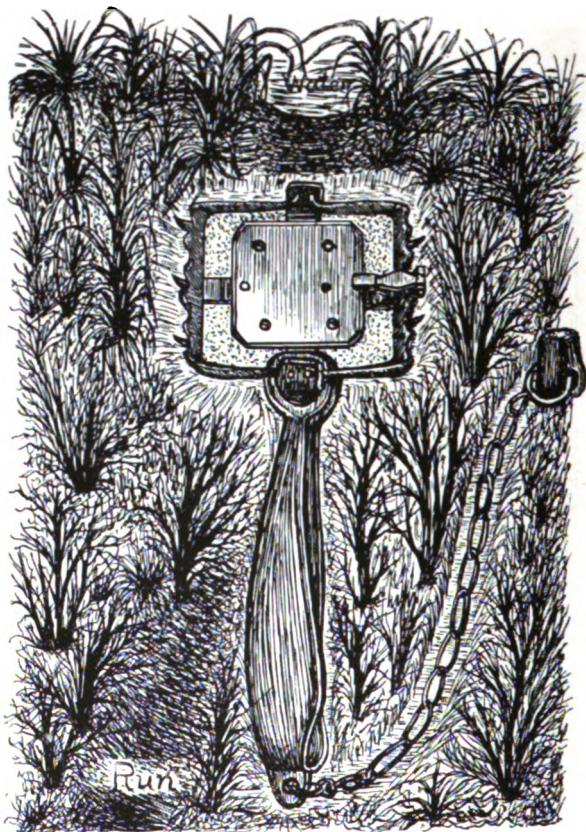


FIG. 83.—VERY STRONG SPIKED OTTER TRAP.
(Supplied by Messrs. WM. BURGESS & Co., Malvern Wells.)

OTTER. To have otters inhabiting a reach of river and to keep up a stock of fish therein is generally regarded as an incompatible condition of affairs. Nevertheless, trout are often found abundant near the haunts of the otter, where it may do some good by destroying big fish that are wary of the wiles of the angler and are

the worst of vermin in a stream. On the other hand, an otter in a strictly preserved stream, and this closely fished, is intolerable; though, if the fisherman be an all-round sportsman, the otter will be allowed some presence for hunting in its proper season. The otter-hunter insists that the food of his quarry consists mainly of freshwater cray-fish, and of eels—deadly enemies to trout streams or salmon rivers. The otter's virtues, however, are mostly regarded as ending upon the river-bank, and as for visiting farm-yards and destroying poultry, and even young lambs, there are no authenticated records.

The otter may be trapped by a strong single or double spring otter trap, with either plain teeth, or both teeth and spiked jaws (Fig. 83), and with 6 in. or 8 in. jaws. The trap may be set in a track of the animal through a bed of rushes or osiers. The trap must be well covered up and the chain well secured by the peg. Some trappers recommend the trap to be placed close to the edge of deep water, and the chain not fastened to a fixed object, but to a piece of lead of such weight that the otter, when frightened by the snap of the trap, instinctively diving under water, can drag it over the edge and thus drown the animal without risk of it wrenching or biting its foot free from the trap. A long line is tied to the trap in order to recover the drowned otter along with the implement of destruction.

RAT. To the game-preserved the brown rat is very troublesome. It destroys the young birds and the eggs of both pheasants and partridges, and also consumes quantities of grain food. Wary and cunning, rats generally are suspicious of a baited trap, and open trapping is carried on under difficulties. Found most frequently in woods and hedgerows during the summer, they should be extirpated there by ferreting. Good working ferret must be used, not too large, and some smart terriers. The holes must be worked regularly and systematically. Of course, rats in woods and hedgerows may be poisoned, but this way of destroying them is too dangerous to be employed in coverts and rearing grounds. There are other ways of clearing woods and hedgerows of these pests. 1. Placing some oatmeal or barley-meal in small heaps in the places frequented by rats, and this every night until they are found to eat it freely. When it is found that they consume all that is placed for them, get some perfectly fresh plaster of Paris; mix it in a quite dry state in equal proportions with the meal; this mixture should then be substituted for the meal in small heaps as before. If carefully done rats and mice will eat it freely; the plaster sets in the stomach and invariably kills them quickly. The great advantage of this method is that should foxes, cats, or dogs afterwards eat the rats, no harm will happen to them. 2. "Ratin," a preparation for exterminating rats and mice, and harmless to larger creatures. It causes among rats an epidemic of a particu-

larly fatal nature, often reaching 100 per cent. The article must be fresh when laid down, protected from sun, light and rain, and be plentifully distributed. A stronger preparation named Ratinin is available when the weaker kind proves ineffectual. Particulars concerning it can be obtained from the Directors of the Bacteriological Laboratory, 17, Gracechurch Street, London, E.C.

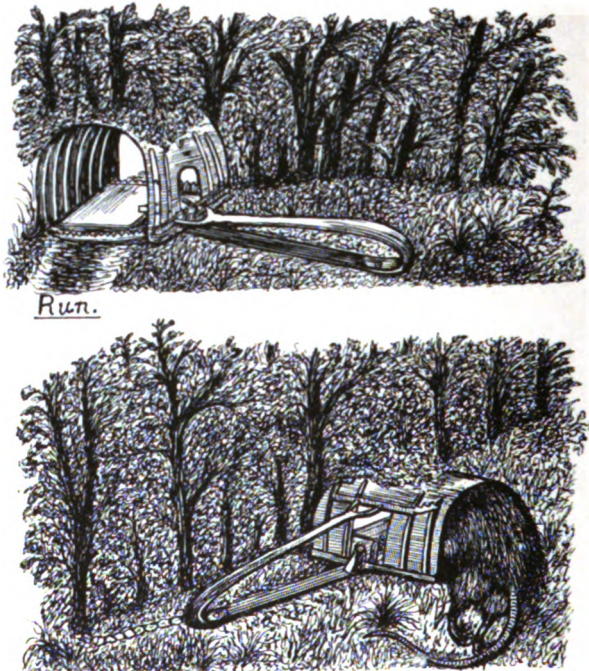


FIG. 84.—EVERITT'S PATENT SAFETY VERMIN TRAP.

The EVERITT PATENT SAFETY VERMIN TRAP, Fig. 84 (supplied by Mr. H. Lane, Eagle Works, Wednesfield, Staffordshire), may be used amongst ground or winged game, poultry, etc., without fear of their being caught or maimed. For rats, set the traps where their runs enter buildings or enclosures. Securely block all superfluous holes, setting only against those most frequented. Cover the table with such material as fine earth, sawdust or chaff, freely scattering it round, and when desired the entire trap may be concealed, without fear of blocking. Another method is to make tunnels of brick or tile, feeding inside with bruised oats, meal, etc., until used freely by the vermin, when traps should be set to intercept. For stoats and weasels, fix a bait a few inches from the

ground in the centre of an enclosure formed of a palisade or brush-wood, leaving apertures for the traps; thus the bait answers for three or more traps, which can be left unattended for a considerable period with impunity, as the victim being killed outright, other vermin are not suspicious of danger. Though the trap does not require fastening down, it is possible that a fox, cat, or dog may seize on the victim that has been killed instantly and carry off the trap along with the animal; it may be advisable to secure the trap by a chain to a peg.

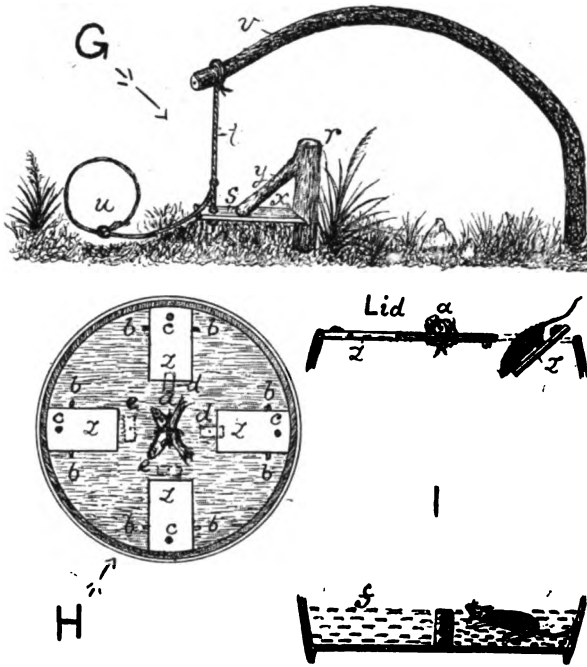


FIG. 85.—SNARE-SPRING AND BARREL RAT TRAPS.

G, snare-spring trap: *r*, peg; *s*, straight stick; *t*, whipcord; *u*, wire snare; *v*, rod; *w*, rat run; *x* notch; *y*, hook. H, barrel trap: *z*, falls; *a*, bait; *b*, pivots; *c*, lead; *d*, button turned under fall; *e*, the same turned from under fall. I, section of top and bottom of barrel; *f*, water.

Foresters, farmers, and gardeners agree with the game-preserver in regarding rats as vermin, the rodents making for dwellings, barns and outbuildings during the winter, and making sad havoc in outstanding corn-stacks as well as in warehouses containing food suited to the animal's omnivorous appetite. Few simple devices have become popular for effecting the capture and speedy death of rats, but some have proved effective, such as the *Snare-spring Trap* and *Barrel Trap* (Fig. 85, G and H).

The SNARE-SPRING TRAP (Fig. 85, *G*) consists of a peg (*r*), a piece of straight stick (*s*) about 4 in. long, with one end chisel-pointed and a slit in the other end, a piece of whiplcord (*t*), fine brass wire noose (*u*), and a rod about 4 ft. long. The noose wire is secured to the whiplcord, this to the chisel pointed stick about an inch from the end as shown, and the other end of the string made fast to the small end of the rod. To set the trap: drive the peg into the ground about 7 in. from the rat's run (*w*) and to within an inch of the notch (*x*), then thrust the rod into the ground about 2½ ft. from it and on the same side as the peg, then bend down the rod and place the chisel-pointed stick under the hook (*y*), fixing in the notch. Put the wire in the slit and adjust the noose in the exact centre of the run, 1 in. from the ground. A rat or other animal pushing its head through the noose displaces the chisel-pointed stick and the rod springs up, suspending the victim.

The BARREL TRAP (Fig. 85 *H*) consists of an ordinary cask with one end out, and a lid with four falls (*z*). The falls are not less than 6 in. long and 3 in. wide, each working on two pivots (*b*), and this end of the fall weighted with lead (*c*) so as to recover its position. Outdoors, sink the barrel in the ground, indoors, place on the floor and set a bundle of straw against the barrel in a slanting direction, covering with an old sack so as to facilitate access to the lid. Place the cover on the barrel, securing the falls by means of a button under each (*d*). Affix a couple of strong red herrings on the centre of the lid (*a*), and scatter some oatmeal flavoured with oil of aniseed about the bait. Entice the rats in that way for a few nights, not being sparing of bait. After the rats take the bait freely and become accustomed to the lid, place in the barrel 9 to 12 in. of water (*I f*), turn each button (*e*) from under the falls, affix the lid by a few nails, bait as before, and the vermin setting foot on the falls drop into the barrel. Remove the drowned rats daily, and after coating with quicklime bury them in the manure heap.

The AMERICAN PERMANENT RAT TRAP (Fig. 86, *J*) comprises a long, narrow box (*g*), 3 or 4 ft. long, and 7 or 8 in. wide and deep. This is set upon another box about 30 in. high, with sloping sides (*h*), so that the first box (*g*) forms the top part of the second box (*h*); the first box is open at the top for about a foot at the rear end, and this open part is partly filled with corn or corn-ears. Immediately in front of this part there is a loose bottom neatly fitted upon pins, so that it will open downwards with the weight of a rat. A piece of lead is fastened to it to keep it in position, or restore it to its place after it has been disturbed. The front of the box is partly hidden with a couple of sheaves of corn-stalks or rye-straw, which form a ready means of access for the rats. At the bottom of the second box there is a narrow box or tube (*i*) fitted, which leads through the building into a barrel (*k*) half sunk into

the ground outside. A loose trap (*j*) is also fitted at the end of the tube. The barrel is covered with a wide board (*l*), with a hole in the centre to admit the light. A few pailsful of water are put into the barrel. At first the loose bottom is pegged fast and the rats, quickly finding out the way to the corn, are allowed to gather there for a week or two, and are fed liberally. When they have taken full possession, the pegs are taken away and the pivots greased,

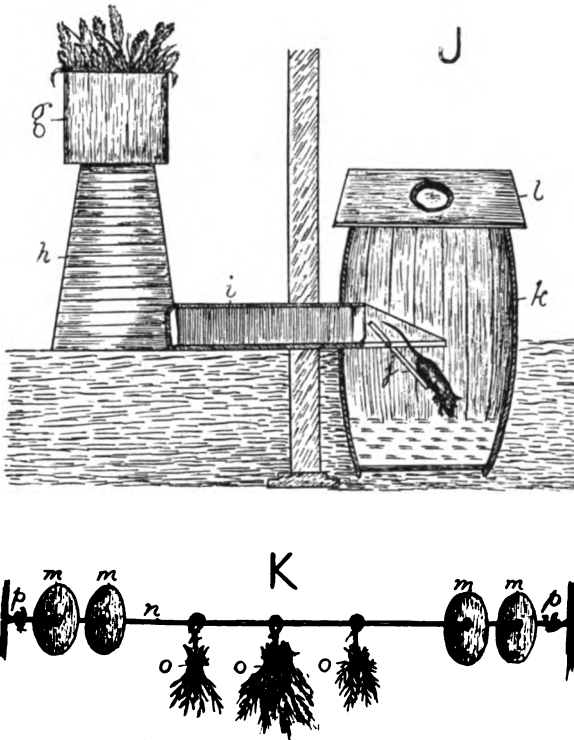


FIG. 86.—AMERICAN PERMANENT RAT TRAP AND RAT-GUARD.

J, American permanent rat trap: *g*, narrow box; *h*, sloping box; *i*, tube box; *j*, loose trap; *k*, barrel; *l*, lid. *K*, rat guard: *m*, fruit-tin bottoms; *n*, cord; *o*, spikes of seed or ears of grain; *p*, hooks.

and the rats are caught one after the other. As they find their way to the barrel, attracted by the light, which they can see through the tube, they are drowned and their bodies can be scooped out daily. The number caught in this way is astonishing, and for a time afterwards few, if any, rats will be seen about the place. Then the pegs may be replaced, and the rats encouraged to gather again. The contrivance is a permanent one and will pay for the

attention it requires. It is not a new thing, and has been used with great success for many years (*American Agriculturist*).

The RAT-GUARD (Fig. 86, K) is a simple method of keeping rats away from anything that is hung up, and is made as follows: "Procure the bottoms of some fruit-cans by melting the solder which holds them upon a hot stove. Bore holes in the centre of the discs, and string a few of them upon the cord, wire, or rope upon which the articles are hung. When a rat or mouse attempts to pass upon the rope by climbing over the tin discs, they turn and throw the animal upon the floor. This plan will be found very effective" (*American Agriculturist*).

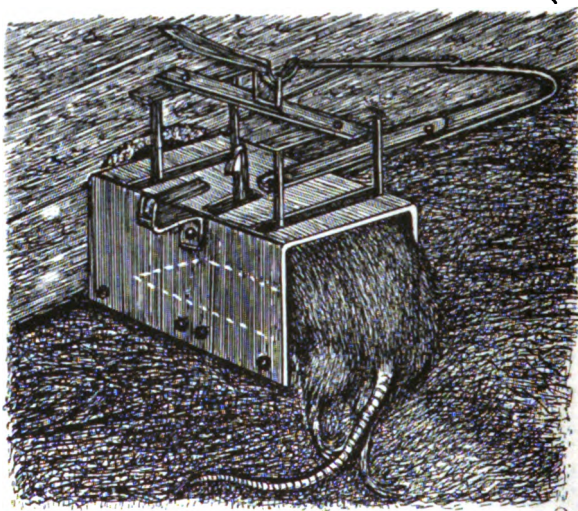


FIG. 87.—EXTERMINATOR TUNNEL RAT TRAP.
(Supplied by Messrs. WM. BURGESS & Co., Malvern Wells.)

But the thing is to capture and destroy the rats. This may be effected by the ordinary spring or *Common Rat Trap* either with round or square jaws, but this catches by the leg and is hardly safe to use where there are cats, dogs, poultry, or winged game. The *Exterminator Tunnel Rat Trap* (Fig. 87) is particularly suitable for setting in buildings and their adjuncts, as it will not catch vermin by the leg, the hook for the bait being inside the trap, and directly the vermin touches the treadle, the trap is let off and the animal is caught round the body or the head; and there being two steel spikes inside at the top of the trap the vermin is instantly killed. The trap may be baited with a herring head for the rat, or with a recently dead chick for stoats and weasels. Of course, the

trap must be set in runs or for holes in such position that the animal cannot avoid passing through. On a plane surface make artificial impediments, such as small stakes thrust in close and upright, leaving apertures, and as soon as the vermin work freely through set the trap or traps.

For capturing rats alive various galvanized wire cage-traps are in vogue. Alfred Clifford's Patent Trap (Fig. 88) has a trap-door in the centre of floor and when set is perfectly level and cannot be noticed. The bait only requires to be laid on the floor of the trap. Immediately the animal puts its weight on the hinged floor the doors close. It has a clear run right through, thereby causing no suspicion whatever. Strongly made in galvanized iron and

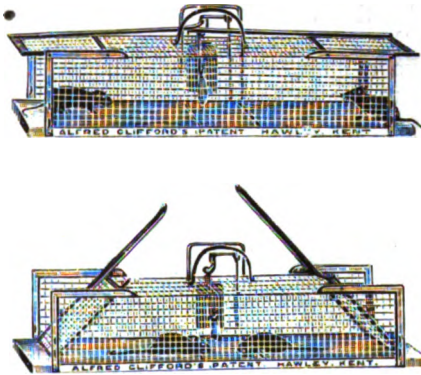


FIG. 88.—ALFRED CLIFFORD'S PATENT TRAP.
(Supplied by Mr. H. LANE, Eagle Works, Wednesfield.)

painted it is very serviceable. It is made in sizes suitable for catching rat, stoat, weasel, rabbit, cat, fox, badger, otter, and other animals, also pheasants and all kinds of birds.

Rats are easily poisoned. Take $2\frac{1}{2}$ quarts of Scotch oatmeal, scald with boiling water; drain. Form 2 oz. of white sugar into a syrup with water, add $\frac{1}{2}$ oz. powdered strychnine, stir thoroughly until a thin paste is formed. Add this to the damp oatmeal, and stir well for a quarter of an hour, then add half a pint of powdered sugar, and five drops each of oil of rhodium and oil of anise, stirring well. Bait with the preparation, without the strychnine paste, two or three nights, and the rodents having been well satisfied with it, will take the complete preparation. Take care to exclude domestic animals and fowls, also to clear away the remains the following morning. The preparation must be used with every possible caution. It is a virulent poison. There are several proprietary rat poisons, of which may be mentioned Sanford's as thoroughly effective.

MOUSE. The *House* or *Domestic Mouse* may be said to serve no useful purpose to any culture, but is a pest in the dwelling, out-building, stackyard, garden, etc., everywhere in presence of food and shelter gnawing and destroying structural work and feeding on animal and vegetable produce used as food for man and beast. To compass its destruction in dwellings, granaries, outbuildings and garden structures there is no trap equal to the *Mouse* or *Small Bird Trap* (Fig. 89), the table being baited with a piece of crust of cheese secured with fine string, and the trap set "tickle" so as to readily spring with the weight of a mouse, placing at the mouth of a hole or where the animal frequents, no covering being required. The mouse will soon "smell out" the bait, and the animal be caught by the body and killed speedily. In this way several mice may be captured one after the other in a single evening by one trap, the operator taking them out as caught and re-setting the trap. It is advisable to have a string to the trap and secure it to a fixed object where there are cats, otherwise the mouse and trap may be carried off.

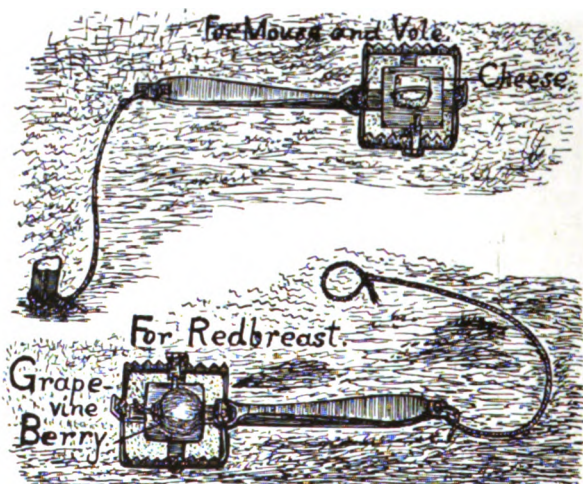


FIG. 89.—MOUSE OR SMALL BIRD TRAP.

(Supplied by Mr. H. LANE, Eagle Works, Weänesfield, Staffordshire.)

In gardens and nurseries the house mouse, as well as the *Wood* or *Long-tailed Field Mouse* is sometimes very troublesome. For the capturing and destroying of both several simple as well as numerous ingenious contrivances have been employed. The commonest and most approved is the Figure 4 Trap (Fig. 90 L). It consists of a flat tile or slate (q), and on soft or cloddy ground a similar one

(*r*), with, when the fall is light, a brick (*s*). Three pieces of wood (plasterer's lath) support the top slate or fall; the upright or standard (*t*), formed like a wedge at the upper part, catch (*u*) notched across about one-fourth from the upper end, and feather-edged at the other, and base (*v*) carrying the bait at one end, notched to fit the upright, and notched in front to receive the catch or part bearing the crushing slate. Bait: cheese crust (the best), broad bean

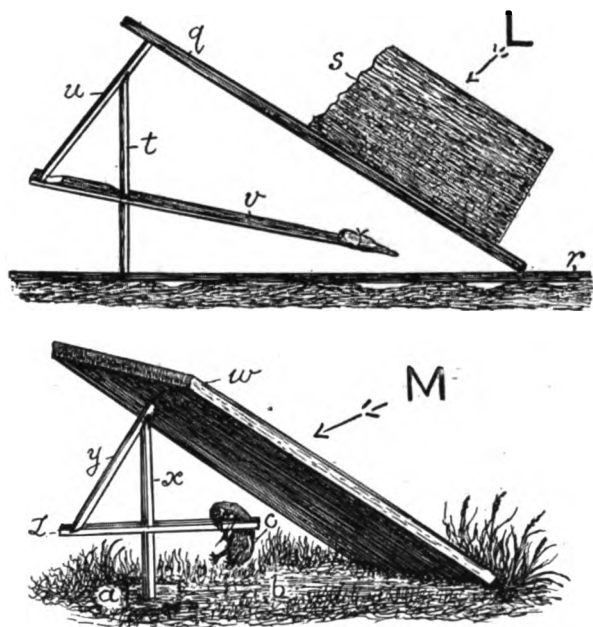


FIG. 90.—FIGURE 4 TRAPS.

L, figure 4 garden trap: *q*, tile or slate, called fall; *r*, foundation slate (advisable on soft or cloddy ground); *s*, brick (desirable when fall light); *t*, upright; *u*, catch; *v*, base. *M*, figure 4 heavy fall trap for rats, stoats, weasels, etc.: *w*, large square piece of stone or thick slate, called fall; *x*, upright or limb; *y*, slanting stick or catch; *z*, horizontal piece or stretcher; *a*, flat stone level with surface of ground to prevent upright sinking into soil; *b*, firm level surface a little larger than size of fall; *c*, bait for rats, stoats, and weasels "drawings" of poultry or game, a small chick, young rabbit in pieces, or pieces of wood pigeon, rats being partial to head of toasted red herring.

or pea, set clear of the bottom. A mouse nibbling at the bait disturbs the hold of the catch on the base or that of the upright, and down comes the slate, providing the standard be sufficiently forward for the catch to throw it forward enough to let the slate drop; otherwise it acts as a prop.

The figure 4 trap *L* is drawn to a scale of $\frac{1}{4}$ in. equals 1 in., and is the size usually employed in gardens, nurseries, etc. for mice, a brick being employed as a fall. For larger animals, such

as rats, the fall should be at least 15 in. square, and if light should be weighted with a brick or bricks so as to make sure of crushing the intruding animal, while the size and strength of the Figure 4 (M , x , y , z) must be increased, the drawing of this part being to a scale of $\frac{1}{4}$ in. equals 1 in. Though this trap may be set in plantations and elsewhere, it must be borne in mind that pheasants and even poultry will peck at the flesh-bait, strike the trap and be caught by the head and killed.

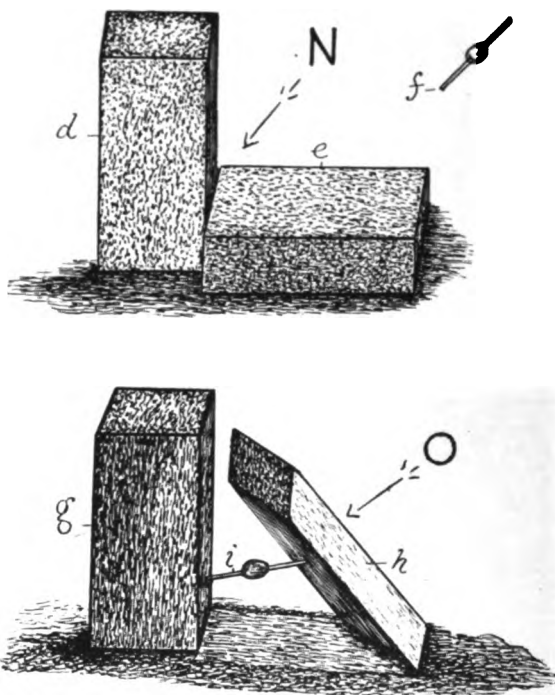


FIG. 91.—KENT FIELD AND GARDEN MOUSE TRAP.

N , adjusting on the ground: d , brick on end; e , brick on flag; f , piece of wire with broad bean bait; O , trap set: g , brick on end; h , fall brick; i , baited prop.

KENT FIELD AND GARDEN MOUSE TRAP (Fig. 91, N O) is a very old contrivance. To form it, provide two bricks and a piece of wire about as stout as a knitting needle and 2 in. long. Place one brick on end (d) and the other flat (e) or even narrow face. Make a point of first placing the bricks in this way, thus indicating the exact distance at which one brick should be from the other when set up, so that when the brick falls it will be in the position represented, leaving no space for the mouse to escape, as it may

if set up too close or too far back. Run the prop (*f*) through a bean or a pea, and place the wire thus baited in a slanting direction (*i*) for the slightest touch to move it, then down comes the brick (*h*). Take care in setting that the prop may not have all the weight of the brick, otherwise it will press so tightly to the other brick that it will not fall with the touch of a mouse. Where there is a wall, as indoors, only one brick is required. A handy man will set up a score of such traps in five minutes, and when baited with suitable substances they form first-rate sparrow or other bird traps.

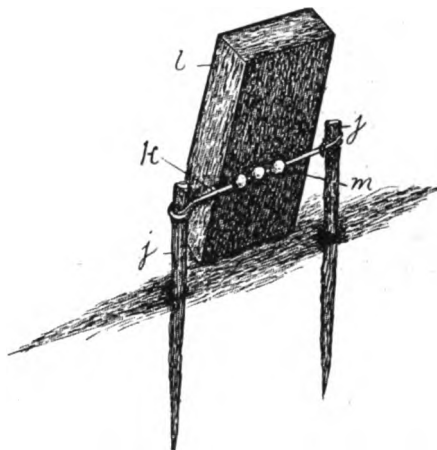


FIG. 92.—STRING BRICK TRAP.

References : *j*, pegs ; *k*, string ; *l*, brick ; *m*, bait.

The STRING-BRICK TRAP (Fig. 92) consists of two pegs, a piece of string, two or three peas, and a brick. To form it, push the two pegs (*j*) into the ground at about 6 in. distance apart, thread two or three peas on soft packthread, string or twisted matting (*k*), tie this tightly to the pegs, the peas being in the middle, and place the brick (*l*) in a slanting direction on the bait (*m*). Then the ground being quite level and firm, down falls the brick when a mouse nibbles through the peas and string, the latter steeped in toasted cheese "fat" just where the peas are placed, tempting the mouse to nibble it through more quickly.

Various forms of fatal traps, always the most humane, may be had of ironmongers, such as the "Irish" with from 3 to 6 holes, catching by the head, and the "Electric" crushing the animal by a stroke-down wire.

Traps for catching mice alive comprise numerous forms, such as the "Tinned Wire," single and double entrance, and "Improved" of both those. "X. L" wove wire in three compartments, and

the always set and baited *Acme*, *Premier*, *Excelsior*, and *Perpetual*, in sizes catching up to twelve mice at a time, may be had of iron-mongers or the manufacturers (Messrs. J. J. Thomas & Co., 360 and 362, Edgware Road, London). We do not, however, advise the catching alive methods for outdoors, and even indoors it is mainly followed to afford sport for juveniles in tempting worse than useless cats to mouse.

Mice, like rats, are readily poisoned, but within doors it is liable to lead to unpleasant consequences on account of the animals dying beneath flooring and in outbuildings, quite apart from the poison or the poisoned rats and mice being consumed by cats and dogs. Waterton's recipe is still in vogue, viz., Two pounds of coarse brown sugar and one dessert-spoonful of arsenic are thoroughly mixed with as much oatmeal as would fill an ordinary washhand basin. Dose, a tablespoonful placed from time to time in the runs frequented by the rats or mice. Shallow vessels of water should be placed near the poison in order that the animals may attempt to quench their thirst induced by the arsenic, and thus die on the spot instead of in their holes.

VOLES. *The Water-Vole* certainly does considerable damage to embankments of streams, ponds and reservoirs, hence an enemy



FIG. 93.—MUSK RAT TRAP SET FOR WATER VOLE.

of riparian owners, and being a great traveller in quest of food is injurious to forester, farmers and gardeners practising in the vicinity of its haunts. Of course, it cannot be tolerated in watercress beds, and is equally objectionable in those of osiers, while in nurseries in proximity to streams it often does serious harm by cutting the roots and in barking the stems of ligneous plants. Indeed, sportive and amusing as *Microtus* or *Arvicola amphibius* may be to the waterside stroller, the cultivator can have no respect.

The water-vole may be captured in the ordinary *Small Dorset Vermin Trap* with 3-in. jaws, but better by the *Musk Rat Trap* (Fig. 93) as occupying less room, set in water-level runs or even in those below the water under the side of the bank, concealing the trap by freshly-cut herbage similar to that grow-

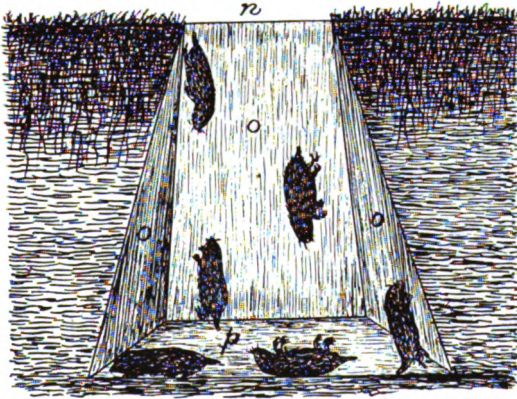


FIG. 94.—SOLID GROUND PITFALL TRAP FOR VOLES.

References : n, open mouth ; o, under-sloping sides ; p, pit bottom.

ing on the bank or in the water, duly securing the trap to a peg by a long chain so as to give the victim opportunity of taking to the water and being held there by the weight of the trap and quickly drowned. The water-vole, having short legs, sometimes escapes capture when an ordinary 3-in. jaws vermin trap is used, even a Musk Rat Trap with $4\frac{1}{2}$ -inch jaws either missing the legs or enabling the animal to escape minus a limb or two ; but generally the vole is caught by the body, especially in the larger traps (5 or 6 in. jaws), and killed at once. Sometimes bait is used on the table such as a raw potato, the trap being so set that the bait is about half out of the water, but the trap carefully concealed. In bank runs the Kentish Mole Trap proves very effective, setting at some distance inside the land entrance to the holes.

The COMMON FIELD-VOLE (*Microtus* or *Arvicola agrestis*) dwells in fields, and is at all times to be found in pastures, attracting

B.N,

L

little notice until, favoured by season and abundance of food, it multiplies into a plague. The grazier suffers most from this animal, the devastations to hill farmers on what is termed "bog" (strong marshy land, either grazed or mown for hay) being ruinous in some years; and from these breeding grounds the voles pass to young plantations, even nurseries and gardens, committing great havoc. The means of repression are almost as bad as the destruction caused by the voles when it takes the form of burning the grass and heather, for unless started from all points so as to enclose the vermin in a ring of fire, they are merely driven to fresh ground, while to burn all the roughness on a hill-farm is impracticable, as some part must be kept to support the stock. Nevertheless, it is really the soft bottom that encourages the voles, hence a periodical burning would be an advantage, thus keeping the bottom clear of useless vegetation as well as the vermin. But this cannot be carried out in woodland glades, hence recourse is had to trapping. The most approved trap for voles is the Solid Ground Pitfall Trap (Fig. 94). It is dug in solid ground in places frequented by the voles, about 15 in. deep, 4 to 6 in. wide at the mouth, and sloping under the soil to a considerably wider bottom. Into this the voles fall, and are unable to escape; besides being exceedingly pugnacious, they kill one another in their efforts to escape. Possibly the Rattin that is employed in connection with rats and mice might afford the much needed relief in such attacks as those associated with Scotland in 1891 and 1892, for only on limited areas is pitfall destruction of the pests feasible.

For the RED FIELD or BANK-VOLE (*Microtus* or *Arvicola glareolus*) that frequents meadows, rough pastures, woodland glades, borders of woods and plantations, there is no trap so telling as the *Mouse* or *Small Bird Trap*, baiting the table with a small piece of crust or hard cheese, and even the field vole cannot resist the temptation to nibble and strike the trap and be caught. A number of such traps properly set and carefully attended to soon clear a given area of either field or "grass" (bank) voles in woodlands, nurseries and gardens. The traps are cheap (4s. 6d. per dozen, 48s. per gross, with flat springs; and with bow springs, 6s. per dozen, 54s. per gross). Kept well oiled, and safeguarded by string and peg, last indefinitely, no covering being required, only set tickle in the haunts or runs of the voles. Of course, this involves trouble late and early, but it is all-important for cultivators to safeguard their crops by timely repressive measures and not rely on aid from stoats, weasels, buzzards, owlets, crows, etc., which no game-preserver is likely to conserve.

A very old-fashioned trap for capturing mice and voles is the *Inverted Sunk Flower-pot Trap* (Fig. 95), which is made as follows: Take a large flower-pot, 11 or 12 in., and sink it inverted on a slate (q) nearly level with the surface of the ground in places fre-

quented by house or wood mice, field or grass (bank) voles. Opposite the hole in the pot and 2 or 3 in. from the entrance, suspend a smooth wooden roller (*s*) turning freely on a piece of wire (*t*), and this hooked (*u*) outside the pot. Smear the roller with lard, or preferably rub well with cheese and dust with oatmeal. Sprinkle a little short straw or rough hay on the surface, but leaving the hole clear, and scatter a mixture of grass and clover seeds about the hole. The short-tailed field-mouse or vole, long-tailed field or wood-mouse, and the house-mouse, alike, will soon gather about

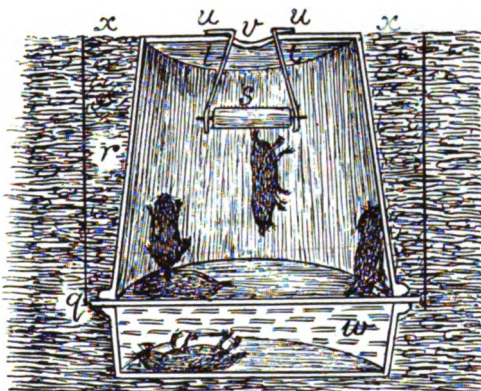


FIG. 95.—INVERTED SUNK FLOWER-POT TRAP.

References : *g*, slate ; *r*, inverted flower-pot ; *s*, wooden roller ; *t*, suspending wire ; *u*, hooks ; *v*, aperture ; *w*, saucer for holding water ; *x*, space between solid soil and flower-pot that may be stuffed with easily removed material so as to empty saucer of dead victims at intervals and renew bait.

the trap and, attracted by the dainty smell from the roller will leap upon it, thence be precipitated to the bottom, whence they cannot escape. The trap acts best when kept dry ; therefore, in wet weather, a ridge tile may be placed over the trap so as to form a run and keep water from the aperture. Instead of using a slate, the flower-pot may be inverted on a saucer of similar size, filling this with water so as to drown the voles or mice as they fall in.

DRESSING SEED BEFORE SOWING. To protect seeds, particularly beans and peas, from the ravages of mice and rats, it is advisable to dress the seed before sowing. For this purpose we have found paraffin oil the most effective. The process is very simple, an ordinary flower-pot sufficing to prepare the dressing as follows : Cork the hole tightly (Fig. 96, *P y*) and place in the seed (*z*). Sprinkle on sufficient paraffin to thoroughly moisten the top layer, then take the pot in both hands by the rim and shake the seed upward with a turnover movement, so as to bring the bottom seed by degrees

to the top, and so on until every seed is thoroughly moistened, adding more paraffin if necessary, and in case of excess of this draining off the superfluous by holding the hand over one side, partly inverting the pot. If a little red lead be dusted on and the seed again shaken up, the seed will be faintly coated with the red lead. This was the way we first used the dressing, but lately have only used the paraffin, and during thirty years it has sufficed to protect

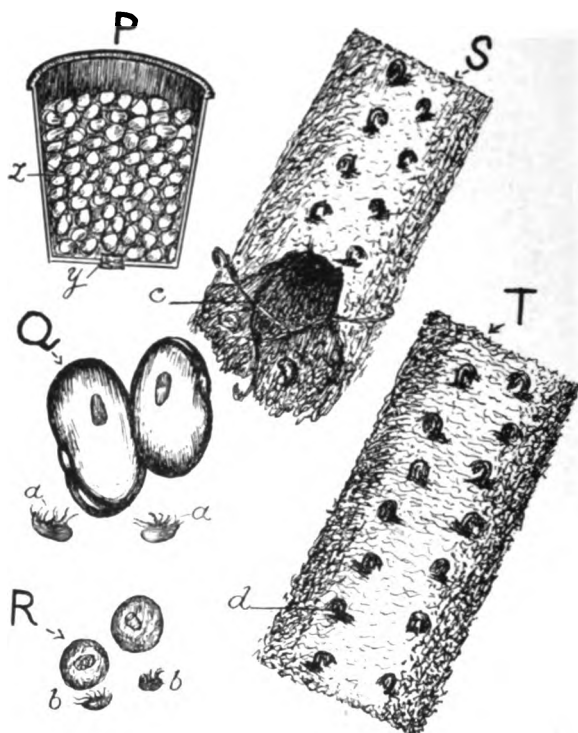


FIG. 96.—EFFECT OF DRESSING AND NOT DRESSING BEANS AND PEAS BEFORE SOWING.

P, section of flower-pot; *y*, cork closing aperture; *z*, broad beans. *Q*, beans which before treatment were infested by bean beetle (*Bruchus granarius*); *a*, beetles come out of beans as result of dressing. *R*, peas infested before treatment with pea-beetle (*Bruchus pisi*); *b*, beetles that have come out of peas as result of dressing. *S*, portion of a row of peas untreated before sowing; *c*, devastation caused by mice. *T*, portion of pea-row from seed treated before sowing with paraffin oil; *d*, plants springing up and undisturbed. (Scale of pot and rows of peas, $\frac{1}{2}$ in. equals 1 in.; beans and peas, natural size.)

broad beans and peas from the depredations of mice and rats. The seed may be dressed on a large scale by simply placing in a vessel and flooding with paraffin and then placing in a sieve over a larger vessel to drain. The seed should be sown at once, covering

with soil in the usual way. If the beans be infested by the bean-beetle, or the peas with pea-beetle, they will be destroyed by the paraffin penetrating through the thin skin of the seed where the weevils lie; indeed, the pests generally eat their way out shortly after treatment and die (*Q a, R b*), while other objectionable pests, such as millipedes, leave the treated seed alone.

Another preparation for beans and peas sown in fields is that known as *Street's Dressing*: sulphate of copper (blue vitriol), 1 lb.; McDougall's sewage carbolic, 1 pint; water, 1½ gallon. Dissolve the bluestone in the water, add the carbolic, stir well, and sprinkle on the beans or peas heaped up on a hard floor, and turn several times with a shovel, using sufficient of the dressing to moisten every seed evenly. It is done the day before sowing, and as the water evaporates, a thin coating of sulphate of copper is deposited on the seed-beans or peas which acts as a fungicide, while the carbolic destroys any bean or pea weevil in the seed, and this is protected to a great extent from being eaten by mice and rats, wood-pigeons, etc.

SQUIRRELS. To plant forest trees, particularly coniferous, with the object of producing timber profitably where squirrels abound is useless, for they bite through the leading growths, especially of spruce, silver fir, and Scots pine, and gnaw the bark of the latter and larch, while they do not fail to cripple broad-leaved species of trees in the sapling state. In these and other ways the squirrel far outweighs in injuries to timber production the good it does by devouring cockchafer grubs, and the pupæ of sawflies and other insects, so that the animal must be classed as an enemy by the forester. To the nut-grower, particularly cob-nut and filbert, no worse pilferer exists than the squirrel, and its delight in walnuts and Spanish chestnuts is evidenced by their being stored for winter and spring use. Luscious gage plums and nectarines are given special attention; not that the squirrel dislikes other fruits, but because those named are more to its taste and easily carried off. Thus the rodent is an enemy to the fruit-grower, and also to the nurseryman, as it scrapes up the cotyledons of seedlings germinating in the spring.

Squirrels are such great ornaments to pleasure grounds, parks and woodlands that they are protected as far as possible by the owners or occupiers; but no opportunity is lost by the budding Nimrod and unqualified sportsman of pelting with stones by hand throwing or catapult, so that the animal outside coverts, parks, and pleasure grounds has little chance of existence; while those protecting squirrels sometimes have recourse to tree guards for preventing the animals climbing tall standard fruit or nut trees. Tying a newspaper (Fig. 97 *U g*) around the trunks, letting it project 6 inches or more, either inclining downward or upward (reverse way shown in the figure), is effective. The rattle of the paper

frightens the squirrels attempting to cross it, and if smeared with gas-tar, their distaste is complete; but the tar must be kept off the stems. A piece of tin or zinc (Fig. 97 *V i*) placed round the stems of trees, projecting 12 in. all round, slightly inclining downwards and toothed at the edge baffles squirrels, also mice and rats.

In many cases trapping or shooting is the only remedy for squirrel depredations. Trapping is not an easy matter, though a few traps set at the foot of a tree the animals frequent are usually suc-

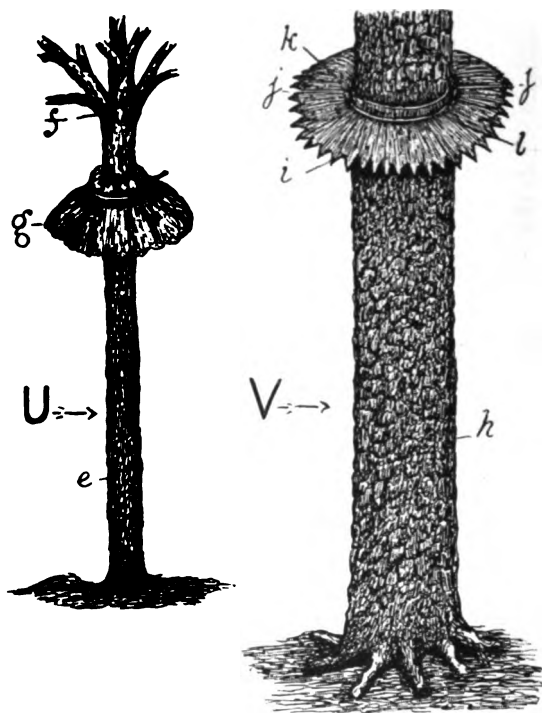


FIG. 97.—TREE GUARDS FOR SQUIRRELS.

U, paper guard on stem of standard cob-nut tree: *e*, stem; *f*, base of head; *g*, paper guard. *V*, zinc guard affixed to stem of large standard fruit or other tree: *h*, stem; *i*, guard; *j*, joint, the collar being made in two pieces so as to be readily placed; *k*, turn over rim; *l*, wire for securing

cessful. If the places be noted where the squirrels lay up stores of sweet chestnuts, acorns, etc., in the ground, and a trap set there, particularly on the clearing away of snow by a thaw after it has laid some time on the ground, a capture is almost sure to be effected. Another good plan is to cut the size for setting a trap in the soil, fill it with fine soil and place where it is proposed to have the table

of a trap a sweet chestnut, acorn, or filbert, and partly out of the ground. Observe when the bait disappears and then set the trap, a hole being bored in the bait and a string passed so as to secure to the table of the trap. Carefully conceal the trap, only leaving the bait partly exposed.

To capture squirrel alive the *Alfred Clifford Patent Trap* may be used, securing to a large horizontally disposed branch, baiting on the floor and tying the doors so that they remain open. Practice this until the squirrels take to the trap and bait and then properly set the trap. If inconvenient to place on a tree, the trap may be used on the ground, some bait being used to attract the squirrels to the vicinity of the trap.

Open trapping of vermin is generally objected to, as a pheasant or a domestic fowl is just as likely to peck at the bait and be caught by the head as a squirrel, hence shooting is more commonly practised, premiums being offered on estates for their tails. At Cawdor, Altyre, as many as 1,164 squirrels have been shot in a season (1867) on Lord Cawdor's estate. The gunner needs to be an expert shot and so fire as not to damage the tree, especially in main stem or leading growth. A terrier dog is very useful, as it runs the scent to the trees the squirrels have gone up and barks very keenly, giving notice to the gunner in search of them.

Squirrels may be poisoned by making a cut in a sweet chestnut or acorn and inserting in the wound a few grains of strychnine, and then closing together again. This, however, is not a safe practice; indeed, it is extremely dangerous to pheasants and poultry, also to human beings, especially children, besides, the use of poison incautiously and outdoors is not legal.

DORMOUSE. These animals must be regarded in the same category as squirrels, being injurious to the forester, and also to the nut and fruit grower, the damage they inflict in woods and orchards being similar to that of squirrels, but in less degree. Under favourable circumstances dormice increase with great rapidity, therefore active measures must be taken to keep them in check. The marten is their great natural enemy, but this friend of the forester, grazier and cereal crop farmer, also gardener, is practically, as the adage has it, "dead as a marten." If dormice multiply unduly recourse must be had to trapping, employing a smaller size trap than for squirrels. The mouse or small bird trap, preferably with a bow spring, baited with cheese as for mice and voles, usually suffices to capture them by the head. If wanted caught alive, as some people make pets of dormice, a box trap will need to be used, a small size "Alfred Clifford" being very effective.

CHAPTER VII

WILD BIRDS

ALTHOUGH birds range over a much wider area than four-footed animals, they are mostly restricted to certain limits of country, food being the all-important factor combined with convenient places for refuge and breeding in the immediate location. This applies to the resident denizens of the woods, fields, and other tracts of country peculiarly suited to the respective species, which, beyond separating for nesting, are not given to leave their domiciles for other purposes than the procuring of food and exercise of their bodily powers. But birds, like everything in nature, are given to change of location through the interference of man with their natural requirements and adaptations, and while some possess facilities for conforming to the new order of things, a number of species are not so fitted for what may be termed cultured necessities, and hence are obliged to leave and find out, if possible, suitable quarters for continuance of existence. These are matters the cultivator is apt to overlook, the changed state of nature in bringing land into cultivation inducing a new order of affairs in respect of bird-life in the location.

RESIDENT

INSECTIVOROUS AND HARMLESS

KESTREL or WINDHOVER. The Kestrel does a considerable amount of good by killing mice and voles, which form its chief food, and in consequence is of great service to the forester, farmer, and gardener. In a certain agricultural district bordering on moorland with extensive woods of mature growth and several young plantations, the gamekeeper—rearing thousands of pheasants annually, partridges, and grouse (on the moorland) plentiful, hares not scarce, and rabbits superabundant—averred that kestrels never interfered with either winged or ground game, and to his credit not one had been shot or captured in a hawk trap during his fifty years' experience on the estate. But may not kestrels acquire a

taste for young game birds in localities where there exists high agricultural practice? This implies relative scarcity of mice and voles, and we have it on the authority of Messrs. Burgess & Co., Malvern Wells, that the kestrel will "take very young game, if easily obtainable, and when once it has visited the coops and found out the young birds, it seems to prefer them to anything else." Thus the interests of the forester, farmer, nurseryman, and gardener, here clash with full indulgence of the game-preserver's sporting tastes.

BARN OWL. This far too scarce bird is sometimes classed among the winged vermin, but we think very unjustly, though some gamekeepers aver that it may occasionally take a young pheasant or rabbit, yet admit that the amount of good the owl does by destroying mice and rats should preserve it from persecution. Besides, it should be remembered that the owl is a night bird, and when it is abroad the young birds should be safe under the hen. Landowners, sporting tenants, and some keepers protect owls as far as possible. Contrarily the poultry-keeper, often not knowing one kind from another, is not so merciful, every bird in the shape of a hawk or owl being shot if coming within range of his coops. What for? The bird-stuffer! Museums must have specimens, cases of stuffed birds must grace dwellings of the well-to-do, and gratify the tastes of indoor ornithologists, even to the depicting of ladies' hats.

COMMON CREEPER. The tree-creeper is so active and assiduous in minding its own business that no one, unless the stone-throwing boy, strives to do it mischief. In woods, on hedgerow trees, in pleasure grounds and orchards, the tree-creeper is most useful, eating spiders, caterpillars, pupæ and eggs of insects, even removing scale to get at the ova.

WREN. Active, fearless, ever searching for eggs, larvæ, pupæ of insects, and in due season feeding its young on green caterpillars, and other soft insects, such as aphides, and never taking any food but small wild seeds, hence altogether a boon to cultivators, even of woods that receive little or no cultural attention.

GOLDEN-CRESTED WREN. Though not so frequently met with in gardens as the common wren, it is quite as fearless, and equally useful in plantations and woods as in pleasure grounds and fruit plantations in destroying the eggs, larvæ, pupæ, and mature insects.

FIRE-CRESTED WREN. This merits the highest encomiums, alike for its beauty as for its value in combating against the smaller insect enemies of trees.

LONG-TAILED TITMOUSE. Nothing but good can be said of this bird in the woods and plantations, and though credited with sometimes doing injury to fruit bushes and trees by attacking the buds, this is not consonant with our experience.

COLE TITMOUSE. In woods and plantations no greater benefactor

to the timber-grower exists, as it feeds largely on the tree's worst enemies, and though visiting fruit plantations and accused of destroying black-currant buds, even attacking pears and apples, these accusations are not verified by our experience. True, the cole tit will pull blossom buds to pieces, but this is not for the vegetable food, for if examined, the buds will be found to contain the larvæ of some insect, so that the work is of a repressive nature. The tits eat the caterpillar and chrysalis of the bud-moth.

MARSH TITMOUSE. To the osier grower the marsh-tit is particularly valuable, also to the alder, poplar and willow growers, as it feeds upon the insect pests of these plants, and feeding on weed seeds, particularly those of the thistle, is useful to the country.

HEDGE-SPARROW. Common and yet most valuable of birds in the garden, field, or wood. All the year it works in favour of the forester, farmer, and gardener, and for services rendered visits homesteads most grateful for bread-crumbs and scraps bestowed by the housewife in hard weather. The earliest in nesting of the caterpillar-devouring birds, the bird-nester is as ruthless as the cuckoo, and worse in effect, as a brood destroyed by the heartless boy means many caterpillars undestroyed without any compensating advantage as given by the artful cuckoo. Though said to be fond of bullaces, we have never known this bird interfere with cultivated fruits.

GOLDFINCH. Happily the goldfinch lives, thanks to the keen eye kept on bird-catchers by policemen, if for nothing less than to set a pattern to Parish and District Councils in keeping down thistle and sowthistle seeds that are allowed to perfect on waysides, waste places, and vacant plots and broadcasted by wind over miles of country. Even the bird milliner is suffering from a dearth of this bird's beautiful plumage, so effectively carried out by County Council officials are the Wild Birds' Protection Acts. Thus the goldfinch is once more becoming plentiful in some districts, and though much depleted by wary bird-catchers to meet the demand for cage birds by bird-fanciers, who are often loudest in acclaiming against enslaving the wild birds of the country, the bird works mightily in the behalf of the tree-lover and the fruit-grower during its breeding season, and afterwards in destroying countless weed-seeds of the worst description. It loves apple orchards because of the caterpillars and other pests the trees provide for rearing their young, and, unfortunately, no other birds are so easily caught in trap cages by means of a call bird and baited with canary and hemp seed, when fully fledged. In this way the fruit-grower often acts, especially if a cage-bird fancier, and by sale of captured birds or by cross-breeding can make money, yet withal clamours for the protection of hawks to save the fruit crops from bud-destroying and fruit-pilfering birds.

WOODPECKERS. The great spotted woodpecker and the lesser

woodpecker may yet be found in large woods, parks, and pleasure grounds, but very deplorably in decreasing number, which may to some extent be due to the greater care bestowed on timber trees by removing unhealthy or decayed examples. Nevertheless, there are some landowners that still delight in old trees, and even here the woodpeckers are becoming rarer year by year. Surely this is a consequence of the rage for stuffed specimens and for the part their plumage displays in bird millinery. To the forester and orchardist no more useful birds exist, as they destroy innumerable pests that may obtain a footing in dead limbs, and from whence would otherwise infect the trunks in certain conditions of season. The green woodpecker is far more commonly seen than the other species, but this is chiefly in woods, woodlands, and pleasure grounds, a clear indication of the preservative influence of the proprietor of the domain and the due regard of his commands by servitors. So tempting are woodpeckers to bird-stuffers, well knowing the value of specimens for museums, cases in halls, and ladies' hats, that liberal prices are given for the shot-where-not-seen examples. Surely legislation can devise some means of reaching the killer through the receiver and penalize both, no matter for which purpose.

LAPWING. The peewit is the most useful of all wild birds to the marsh, meadow, arable, and moorland farmer. It eats not any of his crops, but devours the enemies of his grass, legume, cereal, and root crops. The benefit conferred cannot be estimated, but it must be immense, and as almost all luxuries of the table in wild fowl are derived from the farmer's land, is it too much to ask for the protection of the eggs of the peewit as well as for the bird in close time?

We plead for an enactment by Parliament that would prohibit the killing, as well as taking the eggs, of all the birds before referred to as "insectivorous and harmless," not only in close time, but throughout the year, on the ground of their conducing to the best interests of arboriculture, agriculture, and horticulture, which appeal to the nation's declaration as most promotive of its welfare. The angler may object to this as interfering with the presence of "flies" for his sport in consequence of their destruction by insectivorous birds (migratory included), while the lapwing shooters wax furious over the preclusion of killing the birds in October when in the highest flavour as an article of food. But what does the angler and the lapwing shooter, also its eggs-taker, give to forestry, farming and gardening? The flies (some of them) are land reared, and lapwings spread over the country for breeding, therefore the fen districts and seacoast sportsmen reap harvests at the expense of the tillers of the soil.

RESIDENT

USEFUL AND PARTLY INJURIOUS

NUTHATCH. This bird is not frequently met with north of London, and in the woods of southern and central England is becoming rarer. The reason for this has been attributed to starlings turning them out of the holes in trees they have chosen for their nest, another reason is the bird-stuffer—prompted by stuffed-bird fanciers, and also bird millinery. Feeding mainly upon insects that infest the stems and branches of trees, it is of great service to the forester and also to the orchardist, while not prejudicing the fruit plantations, except in respect of cob-nuts and filberts. This, however, is not pronounced in districts where hazel-nuts, acorns, and beech-mast are plentiful, so that the bird altogether is most useful, and should be protected where not positively destructive.

REDBREAST. Familiar and favoured throughout the country, this bird is regarded generally as entirely harmless, but it will take a heavy toll of red currants, and no worse pest exists in autumn in a house of ripe grapes. It enters the structure by the side or front ventilators, probably in quest of worms, not because the ground is frozen, but from its prying into places for food easiest obtainable. Once it tastes the grapes there is only two things for it, either closely net over the ventilator-openings, or bait a few small bird-traps with a berry secured by the shank to each. There is no need to conceal the trap; set it where easily seen by the robin, and it will soon peck at the berry and be caught by the neck. This is the only repressive measure we have found it necessary to take against the robin, for the few currants it takes in the garden are insignificant as compared with pilfering grapes. Circumstances alter cases, for where there are berries of wild plants in the vicinity, such as nightshade, spindle-tree, honeysuckle, and ivy, the birds will forage more there than in the garden, though often, particularly the young robins, seen hunting under currant and gooseberry bushes and raspberries for insects; indeed, the robin makes itself at home about dwellings as well as copses and woods.

BLUE TITMOUSE. In the woods and fields this bird is faultless. In winter it hunts amongst the boughs and twigs of trees and in hedges for woolly aphis (we have known it clear badly-infested crab hedge-plants of this pest), crab-blossom weevil, aphis eggs, thrips, moths—their eggs, larvæ, pupæ or chrysalis, scale, insect eggs, spiders, also their eggs, including spinning mites, or so-called red spiders; pulls half-expanded buds of crab, wild pear, cherry, and bullace buds to pieces in order to get at the recently hatched-out insects, and some say "bigbud" on hazel invaded by phytophagi, thus assuming the blue titmouse has microscopic eyes. In summer it eats the caterpillars of the magpie and various other moths, grubs of wood-loving insects, maggots in the round galls on oak,

and caterpillars that feed on Britain's predominating monarch of trees—the oak. What a boon to the forester, and to the farmer no harm unless growing sunflower seed for poultry feeding; then it takes to the ripening fruit of this plant before everything else. In the orchard and fruit plantation it is very assiduous in its attentions to apple, pear, cherry, and plum trees, even the gooseberry, currant, raspberry and blackberry, scrutinising them for pests, most of which are also common on wildlings of the same species of plants before named, even taking the moths from the grease bands on the trees, and making end of codlin moth larvæ or pupæ.

On the other hand, it is said to do serious damage to cherries, which we have not observed during fifty years' experience; but it has a decided appetite for green peas, particularly when a brood is near by, and the weather hot and dry, while it sometimes does serious damage by pecking the sweeter and choice apples and pears near the stalks. It also clears ripening sunflower heads of the seeds, and, not least, sometimes eats bees in winter-time, also pulling straws out of thatch in order to get insects or grain.

In order to protect apples and pears fruit-growers should grow sunflowers in their plantations, and to ripen the seed in advance of fruit, thus alluring the blue and also the great titmouse from it. This has been known since the time of Gilbert White, the tits' liking of sunflower seed being mentioned in the *Natural History of Selborne*, first published in 1789. This also applies as regards green peas, it being extremely difficult to net the blue titmouse out, and as for killing it means the destruction of a large brood of young birds; besides, the onslaught on peas is confined to this necessity so far as we have observed. To protect choice apples and pears recourse may be had to the *Cloister Fruit Protector*, which clasps the individual fruit by the stalk and protects it from the birds and other pests. The "protector" is sold by Messrs. Wm. Wood & Son, Wood Green, London.

If the blue titmouse becomes too numerous shooting may be necessary, always so as not to damage the fruit or other trees. In winter-time a few small bird-traps with the tables baited with a bit of fat meat each and placed on branches of trees, or the ground where they frequent for scraps from houses in severe weather, prove effective. Even the old-fashioned brick-trap, well known to all boys, properly baited, catches this and other small birds either alive or kills them at once. It (Fig. 98) is formed of four bricks, three on edge, two forming the sides (*m*) and one the end (*n*) and one stood on end to form the fall (*o*). A peg, about $\frac{1}{2}$ in. diameter and 3 in. long, is driven into the ground at the middle of the enclosure so as to stand an inch or so out of the soil (*p*), a forked stick chisel shaped at the thick end (*q*), and a stick for propping up the fall (*r*). For the blue titmouse the forked piece or table should be baited with a bit of fat meat, and for sparrows, starlings, etc., with bread-

crust, the birds being enticed to a certain spot by scattering bits of bait there for a few days with the trap or traps unset.

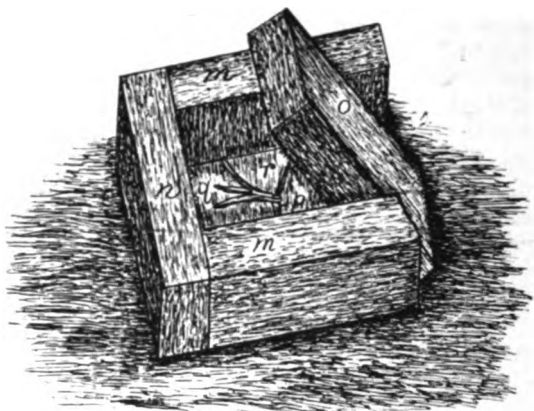


FIG. 98.—BRICK BIRD TRAP.

References : *m*, side bricks ; *n*, end brick ; *o*, fall brick ; *p*, peg driven into ground ; *q*, table ; *r*, prop.

GREAT TITMOUSE. This bird is not nearly so common as blue tom Tits and does not hunt nearly so closely for insects, yet it is largely insectivorous, with a pronounced appetite for fruit, such as yew berries, kernels of beech-mast and hazel-nuts, and in gardens sometimes takes green peas, particularly in hot, dry weather and near a brood, and also harms pears and apples by pecking them near the stalk. It, like the blue titmouse, prefers sunflower seed to everything in the garden, though the aparian says *bees*, and the farmer avers *grain* when it pulls straws out of thatch. Possibly all are right in their deductions, but for keeping tom Tits from pecking pears and apples we advise sunflowers to be grown so as to ripen the seed in advance of and along with the fruit. If the beekeeper must destroy the bird, a bait of a portion of sunflower head in seed on the table of a small bird-trap, or a bit of fat meat in winter time, if set near the hives will make end of the depredator. Fruit-growers may act in a similar manner if the bird becomes refractory, and recourse had to the gun where the numbers are so increased as to necessitate speedy relevance.

MEADOW PIPIT. The forester and gardener has nothing to complain about respecting this bird, and the farmer very little, as with proper covering of seed-corn it does no harm but good by destroying insects, though varying its diet with vegetables and seeds. It feeds largely on the eggs and young of slugs which are deposited and lurk in the debris of meadows, and otherwise clears the surface of numberless insect pests. It ought to be protected all the year.

MISSEL THRUSH. In the northern parts of the kingdom this bird is rather uncommon, though met with in many districts, and when taking to devouring fruit is very severe in its depredations. In recent years its distribution has become more general, possibly a consequence of the closer preservation of game and the restrictions on bird-nesting, and in some localities has so multiplied as to be regarded by fruit-growers as one of the worst birds to fruit, particularly in some of the southern counties. It is specially troublesome with cherries and soft fruits, and after these persistently eats pears, apples, plums and damsons. In the north of England we have found it most destructive to currants, particularly red, though it will take black currants. But where wild fruit or berries are plentiful it does not trouble gardeners seriously; but feeds on wild or covert plants and berries, many game preservers having introduced berry-bearing plants to coverts as food for pheasants in recent years; and in not a few localities there are large breaks of raspberries, currants, and even gooseberries, that have sprung up naturally from seeds assumed to have been carried there by bird pilferers from gardens. These wild or semi-wild fruits—species of *Berberis*, *Ribes*, *Rubus*, *Rosa*, *Cratægus*, *Cotoneaster*, *Prunus*, *Pyrus*, *Ilex*, *Hedera*, *Juniperus*, and *Taxus*—afford a supply of food for the thrush family, and it has been suggested that wild fruits should be planted in close proximity to orchards and fruit-plantations so that birds may be attracted and kept out of mischief. Certainly this is desirable from an ornamental point of view, and also when the woods are some distance from the fruit plantations, it also being right that those protecting wild birds should provide food so as to keep them from going astray; but what of the fungoid and insect pests that would be fostered on wild plants and thence make inroads on the cultivated fruits of the same species?

Alas! there is no help for the fruit-grower but the destruction of the eggs when the bird is relatively tame, and shooting when it will not content itself with wild fruits, it being too wary for capture by trapping. Its utility is measured by the destruction of caterpillars, beetles and other insects, slugs, snails, and worms. The birds are usually found in pairs, in summer time, and later on in small flocks, when they are shy and wild; even in attacking a crop the paired birds keep in close company, and are not easily approached within gunshot. Mistletoe berries, however, are a tempting bait, their fondness for them being noted by Aristotle, and one compensation for the disagreeable task of killing them is that of their being good for food.

SONG THRUSH. For eight or nine months of the year this bird feeds solely on snails, slugs, worms and ground insects, wild fruits and roots, such as the "cuckoo pint," in severe weather. Only when garden and fruit plantation fruits are ripening does it become a nuisance. Reared in shrubberies, hedges, thickets, and woods,

the birds leave as soon as fit to journey for the purpose of obtaining food, and the supplies of animal food being restricted by season, they betake themselves to a frugivorous dietary. Thus they find out the strawberries in gardens and fields as soon as the berries change colour for ripening, and follow on with currants, gooseberries, raspberries, etc. Great numbers may be killed, yet fresh arrivals take the place of the slaughtered birds. Truly there is migration from the breeding places to the fruit quarters, as there also is from these as soon as the fruit crops are cleared to the shrubberies and woods. Of course, there is a thrush migration from one part of the country to another, many parts of the kingdom being almost bereft of song thrushes from October to the end of January, while there is a considerable immigration in the autumn on our east coast by birds coming from Northern Europe; the latter, however, after a short sojourn, mostly departing accompanied by many home-bred birds, while some mate and remain in Britain. Notwithstanding the migrations song-thrushes are to be found in gardens, copses and woods the year round, charming with song betimes in autumn and winter, and rapturously pouring forth their melody in spring. In shrubberies, thickets and woods, thrushes are reared that devastate the fruit crops. No real provision is made for keeping them there, and no restriction placed on their undue increase. Bird-nesting is forbidden by law, fruit-growers naturally say in the interest of the game-preserved, and the "wild bird's protector" who has no fruit upon which depends his livelihood for the birds to devour, while the national taste is not for thrush-shooting as in Belgium, France, and Germany, where it begins on August 12, the birds being esteemed for the table, and their arrival in certain districts regarded with much interest, for they are easily ensnared. Possibly Britons may acquire like taste, and fruit-growers in fields and fruit plantations recoup themselves for the damage done to the fruit crops by killing the birds and disposing of them as food. This, however, is very remote; therefore, fruit-growers must take stringent measures to safeguard their crops of fruit from the pecking and devouring birds.

Bird-minders must have gun licences, costing 10s., and so must the fruit-farmer if he intends to scare or shoot birds, as no one is allowed to carry firearms without a licence. But bird-scaring is of very little use. The birds soon become accustomed to the report of a gun, and while the scarer is at one end of a plot of strawberries extending to acres, the birds are pecking vigorously at the other. Even shooting is an expensive procedure, as it means shooting on the wing, and then there is much damage done in spite of the gunner or gunners. The best thing is trapping; the *Common Rat-trap* (Fig. 99), either with round or square jaws, preferably the latter, is excellent, a partly ripe strawberry being secured by its stalk to the table, and the trap outside the row of plants so as to be easily seen.

No concealment is needed or any covering, but it is advisable to secure the trap by a string to a peg.

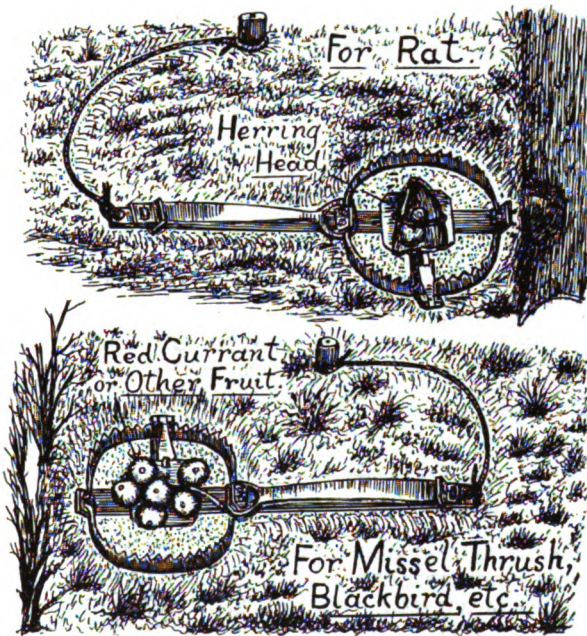


FIG. 99.—COMMON RAT TRAP (ROUND-JAW PATTERN).
(Supplied by Mr. H. LANE, Eagle Works, Wednesfield, Staffordshire.)

The traps, Fig. 102, should be first placed on the strawberry-beds and mainly on the outside rows, or round the plantation, as the "first seen, first taken," and not more distantly apart than 9 feet. Thus a gross of traps would be required for an acre, which (for the best quality trap, always the most serviceable) entails an outlay of nearly £10. In these traps, seen to early and late, probably 3,000 birds may be destroyed in a season, the traps being shifted from the strawberry beds to under the currant, gooseberry and raspberry bushes, then under apple, pear and plum trees, baiting in each case with the respective fruits. Of course, the traps act equally well for blackbirds as thrushes, which are more prone to continue their depredations.

In gardens thrushes and blackbirds are usually excluded from cultivated fruits by netting, old, repaired, herring nets being generally employed. Provided the netting be holeless and at such distance from the fruit that the birds cannot peck it, no harm ensues. But we have found that herring net placed on strawberry-beds with-

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out support other than the leafage was only partial in protecting the fruit, for the birds alight on the net, press it down by their weight and peck the fruit, spoiling it wholesale. In such cases we have had recourse to trapping, a couple of dozen traps properly worked "making-end" of 500 birds in a season.

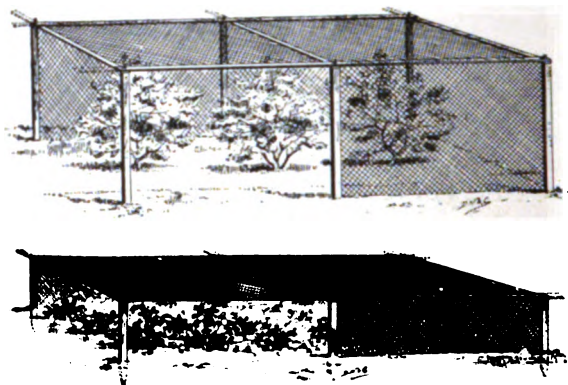


FIG. 100.—FOSTER'S FRUIT PROTECTOR.

(Supplied by Messrs. BOULTON & PAUL, *Norwich*.)

To keep the netting from the fruit so that birds cannot peck it various contrivances are had recourse to, such as stakes driven into the ground and strong laths placed along the top of them. These are cumbersome and not always readily obtainable. *Foster's Fruit Protector* (Fig. 100) is very neat and made in sizes suitable for strawberries, currants and gooseberries, and raspberries, the two latter admitting the fruit being gathered by persons under the netting. The whole can be readily fixed and taken down, and is useful in other ways when not required for protecting fruit.

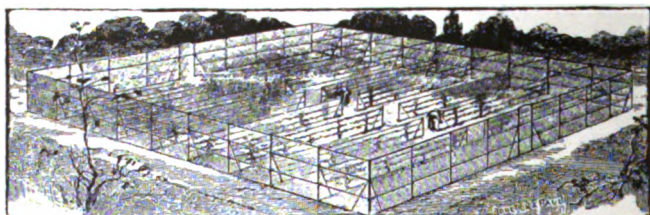


FIG. 101.—PERMANENT METHOD OF WIRING IN FRUIT GARDENS.

(Supplied by Messrs. BOULTON & PAUL, *Norwich*.)

For protecting buds and bloom from birds and frost and fruit whilst ripening, some proprietors of gardens indulge in what are known as "fruit cages," either by means of hurdles or a simple

method of straining wires (Fig. 101), enclosing with bird-proof wire-netting, some only using the latter for the boundaries of the enclosure and string netting on top, while others employ bird-proof wire-netting on both the sides and top. The former mode admits of birds exercising their insectivorous habits in all but the bud and bloom-protecting time and that of the fruit ripening; while the other method entirely excludes the birds. What are the results of the two methods, it may be queried? The most



FIG. 102.—THE BLACKBIRD TRAPPED.

pronounced is that the string-netting top affords the best protection to the blossom, admits of insectivorous birds aiding in preventing attack of pests by destroying their eggs, and other hibernating forms, and also in clearing the bushes and trees of infesting hosts. But as regards infection by insects, the wire-netting top enclosure, consequently total exclusion of birds, subjects are not more infested by insects than those in the string-netting top, and in both repressive measures have to be taken to prevent and subdue them promptly, otherwise considerable damage will be done to the bushes and trees.

Thus we learn that sole reliance upon natural aids in respect of cultivated crops is a delusion, inasmuch as in most cases birds do not begin to work until the pests have committed considerable damage, and in not a few instances do not cope effectively with the insect ravages so as to save the crop from ruin. Except, therefore, in wild or semi-wild, or no "repressive measures" quarters, the good birds do appears to be much overrated, similar remarks applying to ladybirds and their larvæ, the lacewing fly and ichneumon fly, all of which destroy the insect foes of crops.

BLACKBIRD. To the forester; grazier; forage, cereal and root crop, also vegetable-growing farmer, the blackbird is a boon, for in these domains it feeds upon worms, beetles, caterpillars, larvæ of insects, snails and eggs of slugs, and does no harm by devouring

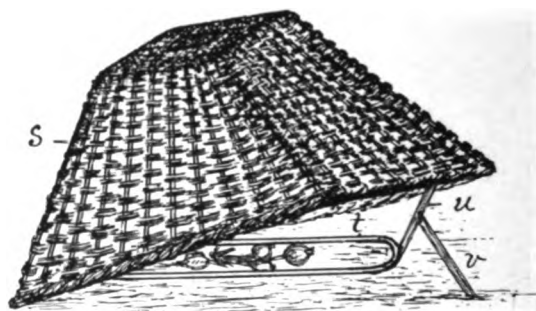


FIG. 103.—THE TAKE-UP TRAP FOR BLACKBIRDS.

References: *s*, basket, 2 ft. 6 in. square, 15 in. high, with door at top for removing the birds; *t*, bent stick in bender; *u*, upper stick with notch; *v*, lower stick.

wild fruits, such as raspberries, blackberries, haws, hips, and berries of dogwood, ivy, and yew. Added to all these properties is its value as food, now unappreciated by Britons, though in Norway rhyme days blackbirds appear to have been a royal dish. Of course, this is in the autumn and early winter time when, for exportation, it would probably be necessary to secure them alive, for which purpose we commend the *Take-up Trap* used for catching pheasants required for pens, but of smaller size.

The blackbird, thrush, etc., *Take-up Trap* (Fig. 103) may be set by hedges, in shrubberies, copses, etc., on level ground; the ends of the bent stick for bender, are fixed in the wicker, the bender being about 2 in. from the ground. The two sticks are then placed in position as shown in the illustration, the upper end in the wicker, but so that it can "fly" inwards, the lower end resting against the bender, and the whole held up by the lower stick, one end of which is placed in the notch of the upper stick, the other resting on the ground. Some apples or other fruit should be strewn underneath the trap inside the bender and the upper stick secured

to the bender so that the trap will not be struck. When the birds take the bait freely, peg some down inside the bender and remove the string preventing the basket falling. The bird or birds step on the bender, and the trap falls and secures it uninjured.

The blackbird is very useful in pleasure grounds, delighting every one with its clarisonous song; but in the fruit garden, plantation and orchard it is the *blackest* of ripening or ripe fruit pilferers, slyly appropriating strawberries, currants, cherries, gooseberries, raspberries, apples, pears, and plums, frequently commencing the attack when the fruit gives the first indication of ripening, or even trying it whilst green. In some localities, where there are extensive shrubberies, copses, and woods, particularly when game is strictly preserved, in the vicinity, it is impossible to grow fruit profitably without destroying the blackbirds, for unmolested they will, in many cases, devour or spoil the entire crop, particularly of soft fruits. Indeed, from the time the first strawberries or bush fruits ripen until autumn the blackbird lives upon fruit, and moves from place to place, and whilst as many as 70 or 80 of these birds along with a few thrushes may be shot by four expert shooters in a morning, and totalling 2,000 in a year on a large fruit plantation, the blackbirds still come every year without any notable diminution. Shooting and trapping is the only remedy, combined with the destruction of all the eggs or young blackbirds in their nests in hedgerows or wherever the game-preserved will admit of access; there being no question of an undue increase of fruit-devouring birds being a result of the close preservation of game on the one hand, and of the increase and spread of fruit cultivation on the other hand.

In gardens and on allotments or small fruit plantations, recourse must be had to netting out the blackbirds as before detailed under thrush. Tanned netting, however, is costly, entailing an outlay of £10 per acre, which, with the extra labour involved, is a serious drawback in profitable fruit production. Sometimes it is necessary to employ netting over the ventilators in fruit houses, particularly cherry and orchard houses, and in some instances tomato houses, as from acquiring a taste of tomatoes on walls and in the open ground they enter glass structures, destroying much fruit by pecking as well as by devouring a considerable quantity. This taste for tomato fruit or berry appears to have been recently acquired, and passes through one generation to another, particularly in dry hot seasons. A few traps, properly baited and set on the ground under the plants outdoors, make an end of the pilferers.

JAY. Despite bird millinery, jays still trouble the game-preserver on account of their fondness of game-bird eggs, yet is of some service, for, ever on the watch, gives notice of intruders in coverts by chattering and scolding, thus indicating that something unusual is going on. The jay also helps the farmer by destroying the eggs of the wood-pigeon, and is useful to the fruit-grower by

eating the eggs of the blackbird. Indeed, it does good by feeding on worms, snails, slugs, cockchafers, beetles, insect larvæ, mice and voles, thus a blessing to the forester, though relieving the woods of acorns and beechnuts. Where a garden is near a wood and there are jays, green peas disappear, also ripe cherries and plums, sometimes cobnuts and filberts, and even apples are pecked and spoiled.

The netting of peas is a serious matter, and that of covering over standard fruit trees impracticable. Shooting, therefore, is the

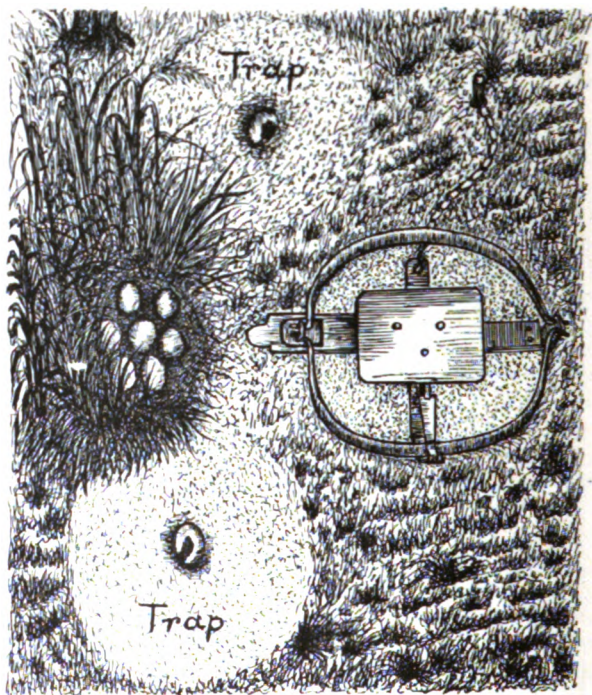


FIG. 104.—MUSK RAT TRAP (AMERICAN PATTERN).
(Supplied by Mr. H. LANE, Eagle Works, Wednesfield, Staffordshire.)

only remedy as regards gardens and fruit plantations, but even this is not easy, as jays are "knowing" birds and as wary and skilful in pilfering as expert thieves generally are, and requiring much cuteness and patience on the part of the gunner, lying in ambush being the surest way to get a good shot, as the jay, like the magpie, will watch and wait, and when the way is clear take advantage. The jay is difficult to trap in the open, but may be taken where there is some short cover or grass, making a nest and placing in it

a few eggs (bantam's preferably), and setting three or four traps round it. The *Musk Rat-trap* (American pattern, Fig. 104) is the best for capturing jays and also magpies. Where jays are numerous, immense quantities may be taken in winter when there is frost by means of the improvised nest of eggs and traps placed round, a dead rabbit being also a killing bait.

MAGPIE. This bird is troublesome to the game-preserved, though less common than formerly, and except in some wild districts or in woods and enclosures where the game is left to take care of itself, is fast becoming extinct. Its depredations on pheasant and other game-bird eggs, and its partiality for young birds and small rabbits render repressive measures imperative. As the nest is large and generally built in the same locality every year, it may be easily found and destroyed. The best bait is egg-shells or eggs, placing three or four on a hedge or in grass near favourite haunts of the birds, or a small rabbit paunched and split. Three or four traps set round such bait will generally prove successful in capture. Some trappers, however, bait each trap with a small piece of bad or high meat, secured to the table or plate, and scatter the traps somewhat thickly. In using paunched or dead rabbit as bait this should be tightly pegged to the ground. Being so uncommon the magpie exerts little influence beyond the woods and their immediate environs, favouring the forester by destroying snails, slugs, cockchafers, beetles, insect larvæ, mice and voles. The magpie eats cherries.

ROOK. The rook has been notorious for damage to corn and grain at seed-time for centuries, inasmuch as Henry VIII enacted that "every one should do his best to destroy rooks, crows, and choughs, upon pain of amercement, and that every hamlet should provide and maintain crow-nets for ten years, and that the taker of the crows should have after the rate of 2*d.* per dozen" (about equal to a present value of 4*d.* per crow). Rooks are still very troublesome on a farm in disturbing and eating corn, maize, and peas, also on newly-planted and mature potatoes. In some cases they are so numerous that many farmers would be glad of an enactment by Edward VII to mulct owners of rookeries with the expenses they are put to in scaring, and with damage to the crops, and also to keep the number of rooks under control by shooting the newly-fledged birds in the respective rookeries to such an extent as make the number at least stationary and not increasing. Good to the farmer is measured by the wireworms, leather-jackets, slugs, snails, worms, woodlice, millipedes, cockchafer and other grubs the rooks consume. That they devour untold numbers of insect pests is unquestionable, but how is it that great patches of cereals are "under-eaten off" by wireworm in the vicinity of a rookery and the rooks not as eager to bill out the pests as they are the seed-grain? Surely the value of rooks to agriculturists is, in not a few instances, over-

estimated. The laying-down of much land in recent years to permanent pasture may have something to do with the severer attacks of rooks on crops than formerly, and also account for their depredations, extending in some localities to the pheasant and poultry-rearing grounds, also to their—in fruit-growing districts—making onslaught on strawberries, cherries, gooseberries, and raspberries, especially in dry weather, and sometimes apples and pears. These, however, are local, rather than general depredations, and certainly of recent acquirement. As everybody knows, the rook dearly loves walnuts, and some say cobnuts and filberts. Fruit-growing extension, therefore, demands a decrease of rooks, not the least of their offences being that of frequenting bush fruit grounds where manure is put on in frosty weather preparatory to digging in when the weather permits, and by settling on the bushes, particularly gooseberries, of spreading and pendulous habit, breaking off branches by their weight and ruining recently planted trees.

Trapping rooks is a very old practice, but is now somewhat precluded, as spring-traps are not allowed to be set in the open for dread of catching winged or ground game, and incurring severe penalties. Nevertheless, there is no difficulty in trapping rooks, as they generally alight on the same spot to clear off corn or bill out potatoes, thus enabling the trapper to judge where to set. The traps can be baited, or just set and left to take their chance. We advise the farmer, to conceal each trap and use bait of springing corn on the table for cereal crops, and a portion of potato, preferably a partly rook-eaten one, affixed to the plate, and the trap so covered that only a bit of the bait is visible, for attacks on potato crops. Thus set, the rook will invariably be caught across the head or neck by the jaws of the trap, and dies in a few seconds. On the other hand, a rook caught by the leg does not stop struggling until away or dead, consequently the bird may take its departure minus a foot, or much torture be inflicted. Of "catch 'em alive" traps the rook is very wary, and as no scarecrow is so effective as a tethered (by the leg) rook, traps with jaws bound with indiarubber are sometimes employed, so that the leg caught is not easily fractured. A very ancient plan¹ of making "fools" of rooks is to procure some v-shaped brown paper bags of small size, and smear the inside to the outer edge with birdlime, setting up in the declivities of the land after sowing corn, or setting potatoes, and dropping into each a wireworm or cockchafer grub easily collected in ploughing or digging. The rook sees the bait, pushes its head into the bag, which adhering causes the bird to "caper" and make his fellows merry, or at least raise a great outcry, and leave the crop alone. Of course, the blinded bird should be captured, and either tethered or killed and hung up as a scarecrow. (See further, p. 240.)

¹ Mentioned in *Practical Trapping*, p. 43. L. Upcott Gill, Bazaar Buildings, Drury Lane, London, W.C.

JACKDAW. Like the rook, this bird sometimes acquires a taste for fruit, probably from scarcity of its usual animal food, but, though occasionally devouring cherries, does but little injury to fruit. The jackdaw's depredations are mostly confined to the game and poultry-rearing grounds, it devouring eggs of pheasants and partridges and away laying hens; also very prone to pilfer young birds. A sharp look-out must be kept for this bird by game and poultry rearers, attracting by a little extra food as bait and there setting traps, or better, shooting the depredators. The number of jackdaws are so few as compared with rooks that neither foresters nor graziers need lament deprivation of their services in destroying pests.

STARLING. Excellent services are rendered by this bird in woods, only when they make roosting places of young plantations they, by their excrementations, ruin the trees, especially belts of conifers. The same remark applies to rooks in their breeding and also roosting places as regards the under-cover, nothing being so unsightly as the bespattering of the leafage and so detrimental to underwood growth, besides surcharging the atmosphere with unhealthy ammonia emanations. Grass, and even arable land farmers, park and pleasure ground proprietors, derive great benefit from the starlings feeding on wireworms, leather-jackets, woodlice, millipedes, ground insects and their larvæ, while urban and suburban dwellers owe much to the verdure of their lawns and relative freedom of their gardens from ground pests to the starlings they will not allow to make nesting-places in roofs; yet so convinced are urban and suburban dwellers of the good influence of these birds that some provide nesting-boxes, pigeon-cote fashion, on poles, or affixed to a tree so as to resemble a broken-off branch and hole.

To the cherry-grower no worse pest exists. Only the gun can keep the crop from destruction by starlings, and that means expert shots and four of such to the acre. Count the cost of this prevention and see what profit is left to the grower, when possibly the vision may clear so that reason may appear on the side of preventing undue increase. That starlings have greatly increased is the verdict of fruit-growers on all sides, and this increase led to the acquiring of new tastes, onslaught being made on raspberries in fields, on damsons and even apples and pears in orchards. To augment the British-reared starlings not a few come from abroad, which may possibly be turned to advantage, for the birds are said to be delicious eating when baked in a pie with some bacon under and over the plucked and drawn, peppered and salted birds.

In towns, starlings may be caught in severe weather and ground covered with snow by making a clear space a foot wide and running a cord along it attached to pegs, strewing in the track broken-up bread crust, bits of meat, or other scraps. When the starlings, joined by sparrows galore, take the bait freely, remove the cord and

in its place affix one with hair nooses. The result will be a number of starlings caught, along with many sparrows, the latter making excellent pie. In the country a number of horsehair nooses attached to a cord of several yards length, the longer the better, and laid down in a grass field where manure is dotted over it in heaps ready for spreading, especially if placed near or just by the edges of these heaps, will effect capture of great numbers of starlings, cold weather being chosen for snaring. Why these birds should not be exported is matter for surprise, the taste for small birds as food being so pronounced abroad.

HAWFINCH. This bird is so shy in its habits as to escape detection in plundering green peas, and accordingly has to be watched for incessantly to secure effective shooting. Netting out is the only safeguard, shooting being too expensive and uncertain for general adoption. As it is increased to excess in some localities, game-preservers should grant permission for the destruction of the nests in woods to persons not likely to disturb game, or give instructions for decimating this lover of apple and pear pips, and some say damsons and cobnuts and filberts. It is useful by capturing quantities of insects in summer, principally for its young, as many as forty caterpillars having been found in a female bird.

CHAFFINCH. This bird is a great friend of the forester, as it feeds largely on insects, bringing up its young almost entirely on an insect dietary, chiefly small caterpillars and aphides, and eats quantities of weed-seeds. To the farmer the chaffinch is both a friend and foe; the former on account of its destroying countless insect pests, and weed seeds, and the latter through its plucking up newly-sown seed and sprouting crops, particularly those of the *Cruciferae*, *Compositae*, and *Gramineae* orders of plants. Of *Cruciferae*, swede, turnip, thousand-headed cabbage or kale, kohlrabi, cabbage, rape, and mustard are the principal crops grown for stock; while of weeds are the famous charlock, shepherd's purse, cuckoo-flower, hedge mustard, wild radish, and penny cress or Mithridate mustard. Of *Compositae*, yarrow or milfoil (only used on light soils), and chicory represent farm crops; but of weeds there is the notorious dandelion, daisy, May-weed, hawkbit, hawkweed, sow thistles, corn marigold, groundsel, ox-eye daisy, prickly thistles, knapweed, stinking chamomile, beautiful cornflower, and burdock. Of *Gramineae*, wheat, barley, oats, and rye represent farm crops grown mainly for the sake of their grain, and rye-grass, cocksfoot, foxtail, timothy, etc., are grown for their herbage, while of weeds the dread darnel, common bent, marsh bent, black bent or hungerweed, oatgrass, brome grasses, meadow barley grass, quaking grass, and Yorkshire fog. Balance in these three orders alone the evil the chaffinch commits against the good it must do in the matter of devouring the seeds. Of *Caryophyllaceae* the farmer only grows spurrey and that very rare'y, of weeds he has to contend with the white and red

campions, and catchflies, the stitchworts, the sandworts, and the ragged robin of hedges and fields; chickweed, and corncockle in arable land and cornfields, and the narrow-leaved mouse-ear chickweed in pastures. Of *Linaceæ*, flax is cultivated; purging flax is a weed of poor land. Of *Leguminosæ*, beans, peas (certainly not eaten by chaffinch); white cow-grass, alsine, crimson trefoil, and suckling clovers; lucernes, sanfoin, and tares, with birdsfoot trefoil and kidney vetch on poor soils; furze, broom, rest-harrow, meadow vetchling, and a dozen species of wild vetch representing weeds. Of *Umbelliferae* field crops are carrot, parsnip (not much used as cattle food), sheep's parsley; of weeds, hedge parsley, cow-parsnip, shepherd's needle (in cornfields), pignut (in pastures), and poisonous umbellifers, hemlock, fool's parsley (both land plants), water dropwort, water parsnip, and cowbane (a trio of water plants). Of *Solanaceæ*, only potato is cultivated, while wild exist the foul-smelling henbane, bittersweet and deadly nightshade. Of *Labiatae* not any species are grown by agriculturists or only as weeds; white, and red deadnettles, hempnettle, bugle, and self-heal. Of *Borraginææ*, prickly comfrey is grown for fodder and silage, and as weeds common comfrey, corn gromwell, forget-me-nots, and scorpion-grasses. Of *Chenopodiaceæ*, beets and mangel-wurzel are grown with various species of goosefoot as weeds. Of *Polygonaceæ*, buckwheat is the only farm plant, unless sheep's sorrel be claimed; but docks and sorrels are common weeds of grass land, knot-grass and climbing bistort of cornfields and often occur on arable land. Of *Urticaceæ* only the hop is a field crop, while stinging nettles are seen in every hedge and spreading therefrom. *Liliaceæ* has no field representative except as a market-garden farm crop, then onion and asparagus compete with the wild garlic in cornfields, and meadow saffron of the closely allied order *Melanthaceæ* in meadows and pastures. *Juncaceæ*, rushes; and *Cyperaceæ*, sedges, have no feeding value. *Papaveraceæ*, includes the poppy (species of which is occasionally grown for the "heads"), a persistent weed of cornfields. *Ranunculaceæ* embraces the kingcup, crow'sfoot, spearwort and marsh marigold, the pheasant's-eye of cornfields, and the wind-flower of the woods. *Fumariaceæ* includes several species of fumitory, common weeds of arable land. *Geraniaceæ* comprise about a dozen species of cranesbills or geraniums, two or three of which occur upon arable land and meadows, and their seed is sometimes introduced in impure samples of clover seed, and the meadow crane's-bill in pastures. *Rubiaceæ* includes the hariff not uncommon in cornfields and plentiful in hedgerows, rabbits eating it greedily, and the knob-like bristly points adhering to clothes and sheep's fleeces, blue Sherardia or field madder common in cornfields, and on poor meadow and downland the yellow bedstraw or cheese rennet. *Convolvulaceæ* embraces the small bindweed, a troublesome pest of cornfields and potato beds, and the great bindweed, usually

confined to hedges, clasps the fruit-farmer's bushes, while dodder entwines flax and clover. *Scrophularineæ* is represented by toad-flax, red bartsia in cornfields, yellow rattle in meadows, figwort in damp meadows beside ditches and is poisonous; eye-bright, lousewort and cow-wheat, mullein in hedgerows, and speedwells

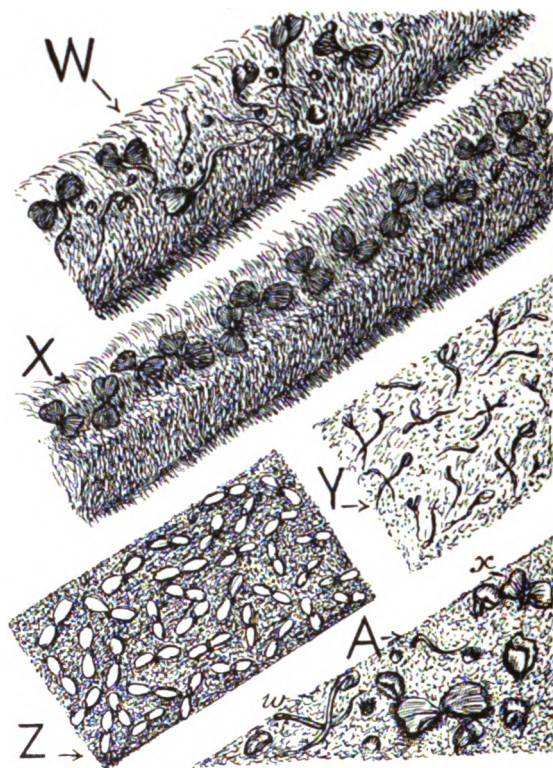


FIG. 105.—EFFECTS OF NON-PREVENTIVE AND PREVENTIVE TREATMENT.

W, undressed Brassicas pulled up. X, dressed Brassicas untouched. Y, untreated lettuce. Z, treated lettuce. A, sprouting radish: w, untreated; x, treated.

or bird's-eyes upon arable land and waste places. *Orabanchaceæ* includes the broomrape which attacks clover. *Primulaceæ* embraces the cowslip and primrose of grassy places and meadows, and the scarlet pimpernel of cornfields. *Plantagineæ* claims the ribgrass or plantain, its seed often seen in samples of clover seed and its "bobtail" spike in seed given to cage birds, which, including chaffinch, are fond of the seed.

Of all the weeds enumerated and their seeds broadcasted by natural agents that dispute the possession of the land with a grow-

ing crop, how many are destroyed in the seed by chaffinches? The flocks, making no distinction between males and females, that are said to harm newly-sown seed and sprouting field crops. Certainly chaffinches eat corn badly covered, and seed or springing up plants of cabbage and turnip, but surely the birds can be prevented from taking either seed corn or sprouting plants by the simple process of red leading before sowing, as we have practised for over half a century and found effective against all the finch family. The effects of the process or otherwise (Fig. 105) will be suggested.

In fruit gardens and orchards we have not known the chaffinch to do any harm, but much good by clearing trees of small caterpillars, aphides on apple, cherry, plum, damson, and other fruit trees, chiefly in breeding time. It is said to be very fond of lady-birds and their larvæ, but we have noticed both left on aphid pasturage after the chaffinches have been at work, and not many aphides. Further, it is stated to be a great disbudder of gooseberries, currants and plums, which we have never seen, and further found in twos and threes all over a fruit plantation after frost eating the buds, while later on "squeezing" the blossoms of plums, cherries, gooseberries and currants, to extract the honey in them. Where the honey comes from but the honey tubes of aphides, it is difficult to determine, and for what reason the squeezing; but surely the birds must have been bullfinches, not chaffinches, in company with house-sparrows taking the buds. It is also said to eat beechnuts and beech seedlings, seeds of Scots pine and other conifers, truly, according to report of Mr. W. E. Collinge and Mr. F. Smith, as given in a paper read at the Fourth Ordinary Meeting of the Society of Arts on Wednesday, December 12, 1906, not worthy of protection in respect of farm crops and fruit plantations.

In the garden we have never known the chaffinch interfere with any crop other than those of the Cruciferæ (cabbage tribe), and Compositæ (lettuce, salsify, etc.), and these are effectively safeguarded by coating the seed with red lead before sowing. The seed is simply moistened with water in small quantities in a flower pot as advised for peas and beans, brushing up with a soft painter's sash brush so as to make the seed evenly damp all through, and then sprinkle on the red lead and again brush up the seed so as to coat it thoroughly with the red lead. Seed of all brassicas, radishes and other Cruciferæ, also lettuces, salsify and other Compositæ, so treated before sowing are never taken by the chaffinch or other finches. On a large scale the seed, grain included, may be first thoroughly wetted with gas-tar water, boiling $\frac{1}{2}$ lb. of gas-tar in 2 gallons of water for half an hour, or until it will readily mix with water, and then diluting to 50 gallons, and while damp sprinkle on the red lead and move about so as to coat the seed or grain. This is effective against all newly-sown or sprouting seed-devouring pests, including the famous rook and wood-pigeon, also pheasant and partridge, and

obnoxious to ground insects and parasitic fungi. As the quantity of tar water is excessive for most requirements, a proportionate quantity may be prepared, even as little as 1 oz. gas-tar to a pint of water, boiling for half an hour or until readily mixing with water and then diluting to 6½ gallons. Gas-tar water is a good preventive of insect eggs' deposition, particularly those of sawflies, and dipterous pests, and also useful as an insecticide and fungicide.

GREENFINCH. In all but the breeding season the green linnet is present in flocks throughout Britain, particularly in cultivated and wooded districts. They frequent gardens much less than the chaffinch, but, like them, are to be found around the corn-stacks and farm-buildings in winter. The green linnet eats but few insects, far less than the chaffinch, and these mostly in rearing the young, yet this is varied with soft seeds or herbage. Its value is mainly dependent upon the weed seeds it eats, but this advantage is discounted by a large quantity of grain consumed in cornfields and much damage sometimes inflicted on sprouting crops of the Orders Cruciferae, Compositae, Leguminosae, it being particularly fond of milled sanfoin seed. In gardens, occasional onslaughts are made on fruit buds and blossoms by greenfinches, but this is very indifferently authenticated, and according to our experience not satisfactorily determined, for it does not follow that because greenfinches are seen about in flocks and even on bushes or trees more or less denuded of buds, they are the culprits. But their services are so restricted in gardens and fruit plantations to command protection, though said to feed the young with small winter moth larvæ and various injurious tortrices. It is also said to be terribly destructive in hop grounds, coming in large flocks and pulling hop flowers to pieces and littering the ground with flower-bracts.

In winter greenfinches roost in evergreen bushes in pleasure grounds, in ivy-clad low trees in hedgerows, and other sheltered places in woods, thickets being favourite hostleries for finches. In these lurking-places some of the greenfinches may be captured by means of the *Sparrow Batting Net*, in which the net is mounted on bamboo canes 17 ft. long, bent arch shape and designed to fold in the middle, working the bushes or ivy at night, also hayricks and corn-stacks. In winter a train of corn screenings may be placed on the ground in severe weather, the snow being cleared, and when the birds take the bait freely, either wait in ambush and pour into a flock a charge of small shot when feeding and another on the wing, or place a string along the track with a number of horsehair nooses. The nests may be taken in breeding time, but the difficulty is to reach them on account of the restrictions of the game-preserve, and it is also difficult to pour in a volley of shot amongst a flock rising from newly-seeded land, or the harvest field, so wary are the birds.

COMMON LINNET. Like the greenfinch, the brown linnet devours

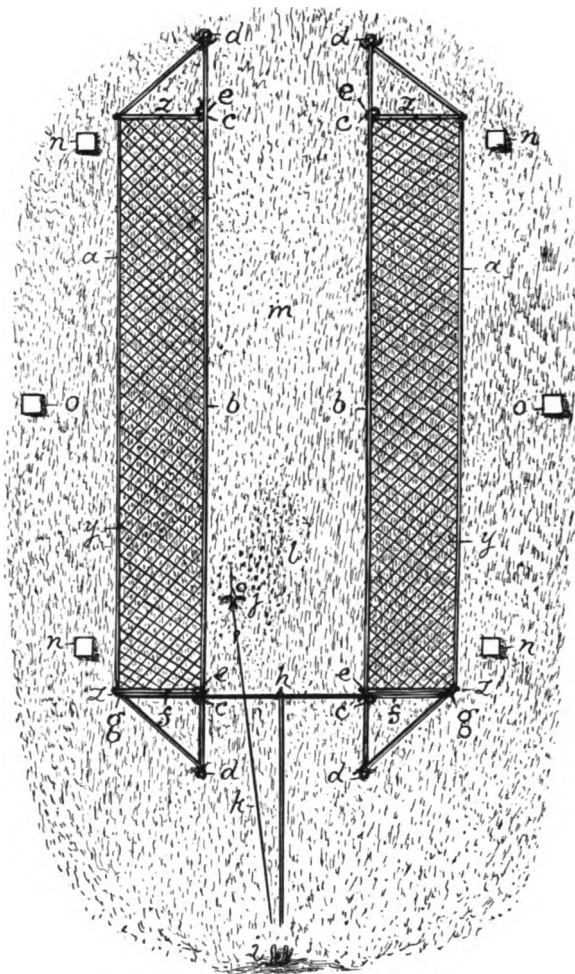


FIG. 106.—GROUND CLAP NET.

References: *y*, nets, two-thread, mesh $\frac{1}{2}$ in., $2\frac{1}{2}$ yds. wide, 12 yds. long; *z*, staves, red deal ferruled and jointed in middle, 5 ft. 6 in. long when joined; *a*, top line (clock cord); *b*, bottom line, three-thread or whipcord; *c*, chief pegs, ash and notched; *d*, bottom line extension pegs, notched, to which both bottom and top lines secured; *e*, loop by which bottom of stave secured to chief peg and acting as a hinge; *f*, forked line; *g*, forked line tied to end of staves in a notch; *h*, knot on pull line exactly in centre of forked line; *i*, position of bird-catcher, 30 yds. or more away from end of net; *j*, playbird, either decoy or live bird; *k*, playbird string, 30 yds. or more away from end of net; *l*, scattered seeds; *m*, space on which wild birds align; *n*, cage birds of poorest notes; *o*, call birds of best and loudest note. Scale, $\frac{1}{2}$ in. equals 1 ft.

quantities of weed seeds of the most obnoxious kinds, and though mostly in waste places and by hedgerows and in stubbles, their work

is of service to foresters, farmers and gardeners ; inasmuch as the more the birds consume the fewer there will be for distribution over cultivated land. On the latter ground they do but little harm, the most that can be laid to their charge is occasional descent on newly-sown seeds, but these are so exceptional as not to materially injure the crops. Besides, the birds are so much in request by cage-bird fanciers that bird-catchers so thin their number in autumn and winter that they are prevented unduly increasing, while in many districts the common linnet becomes rarer and rarer as the years roll by, so that the smaller denizens of the woodlands and fields are not dependent for decimation upon the hawks, owls, jays and magpies, but really is inducted by those enslaving the wild birds of the country as cage-birds. The linnets are usually caught by means of fall-nets and call-birds, of which we subjoin a diagram as set, and known as a *Ground Clap Net*¹ (Fig. 106), though there are other more elaborate devices.

The ground clap net shown in the diagram is that we have seen in most general use by bird-catchers, particularly for linnets, etc., and is laid as follows :—

The right or left (as the person is right or left-handed) hand net is spread out (*y*), and the two chief pegs driven in (*c*), where the staves are attached by a loop of strong cord so as to act as hinges (*e*) ; the end pegs are then driven in (*d*), and the ends of the bottom line (*b*) made fast to these pegs and also the ends of the top line (*a*). The other net is then spread parallel to the first laid and 6 in. less than the length of both staves so as to overlap that extent when “clapped” over the netting ground (*m*), and pegged down in the same way as the other net. The forked line (*f*) is then tied to each top end of the staves (*g*), and exactly in the centre of the forked line the pull line is knotted. The pull line is continued 30 yds. or more from the forked line where the bird-catcher stands. In some cases a play-bird is employed, particularly for linnets, goldfinches, and other small birds in repute as cage-birds, when what is known as a “playstick” is used. This playstick consists of three parts, the ground peg formed of a piece of hard wood about 7 in. long, sharpened at the lower end and with a round hole close to the top for passing the playline through. Just under this hole a square aperture is made in which a flattened point brass tube is to work, and in the other end a twig is affixed. On this twig the playbird is tied by a brace—two loops intersecting each other and tied on one piece of string with a knot in the centre. The head and body of the playbird is thrust through, so that a loop catches it on each side and in front of the wings, the legs and tail being thrust through the other. Thus one loop comes on each

¹ First figured similarly in Mr. Montagu Brown's *Practical Taxidermy*, and also in *Practical Trapping*, p. 66.

side of the body behind the wings, and the two loose ends are attached to a swivel, which by means of another string is made fast to the playstick near its end, and the bird is thus at liberty to use the wings and legs. The end of the playstick rests on the ground, the other end working in the slot, and the playline attached to the playstick near the bird is passed through the upper hole in the peg and extends to where the bird-catcher stands.

Cage-birds are placed at the corners—the less conspicuous the cage is the better—(*n*), and the “call” or best birds at the middle of the sides (*o*). A little food and water is placed by the playbird (*j*) and some scattered in the clear space (*l*). All is now ready for capture. The cage-birds tune, and directly the wild birds appear the play-line (*k*) is smartly pulled, jerking the playbird upwards to appear natural. The wild birds alight around the play-bird and commence feeding, when the bird-catcher smartly jerks the pull line, which causes the forked line to fly inwards, and acting on the hinged pegs and top and bottom lines as by a lever, the staves rise from the outside, become upright and fall over, enclosing all within the open space in the nets. As the nets are wider than the staves they bag and thus prevent the birds fluttering along the ground, until they get out by getting entangled or rolled up in the meshes. The great objection to this ground clap net is that of the play-bird, as the constant pulling up and down and worry of the falling nets very soon kills it, hence the poorest noted birds are always used for this purpose, while the humane bird-catcher uses a stuffed bird or dispenses with the play-bird altogether, placing a cage-bird or two in the open space. Linnets and similar birds appear to be easiest captured from September to December inclusive, or even later in severe weather.

The ground clap net may be used for catching larger birds, such as starlings, but these being wary the pull line will require to be much longer, as the nets may require to be placed in one field and the bird-catcher needs to retire behind a hedge in the next field, the pull line being drawn through the hedge. In winter-time almost every kind of seed-eating bird may be caught by the ground clap net, the nets being laid and the space between them baited with screenings from the winnowing machine or even hayloft sweepings for the finches and linnets, or broken up dry bread, not sopped, for sparrows and starlings, and when the birds take the bait freely see that the apparatus is in working order, and with the pull-string in a secluded place await the coming of the birds and promptly act when prospect of a good capture. In this way both starlings and sparrows may be secured in quantity either for trap-shooting practice or, better, for starling and sparrow pies. The evil of the ground clap net is that of capturing friends, such as the hedge-sparrow, as well as foes, such as greenfinches, and not liberating the former, but indiscriminately destroying all the captured

birds ; therefore, the practice should not be tolerated on other than strict conservation of the useful species.

HOUSE SPARROW. The forester is the only cultivator that does not suffer severely from an over-abundance of sparrows, while the corn-farmer is most seriously affected, and in little less degree the owner of poultry by taking the food given to fowls, as also a goodly part of pigs' feeding-stuff, the gardener having no worse plague in devouring seedlings, pulling flowers to pieces, "browsing" on sprouting peas, beets, lettuces, spinach, etc., and after tasting green peas is a perfect gormand. Fruit-growers pronounce the sparrow a great offender, especially in winter and very early spring by destroying the buds of gooseberry and currant bushes, also those of plums and particularly damson trees, even "setting-on" the gooseberry flowers, squeezing them for the nectar, and causing the incipient fruit to drop. This gooseberry flower destruction is also attributed to the chaffinch, and appears a habit acquired within the last few years. The sparrow is also said to injure the blooms of plums, cherries, and sometimes of apples, pulling the flowers to pieces ; even charged with taking a few ripe strawberries, cherries, gooseberries, cobnuts and filberts. These depredations seem to occur in districts where fruit-growing has taken the place of ordinary agricultural crops, and is worst near buildings and high trees.

According to Mr. J. H. Gurney and Col. C. Russell's *The House Sparrow*, the food of an adult sparrow, based on the careful examination of nearly 1,000 sparrows at different times of the year, through fifteen years, is :

"Corn, 75 per cent. ; seeds of weeds, 10 per cent ; green peas, 4 per cent ; beetles, 3 per cent ; caterpillars, 2 per cent ; insects which fly, 1 per cent ; other things, 5 per cent. In young sparrows not more than 40 per cent. is corn, while about 40 per cent. consists of caterpillars, and 10 per cent. of small beetles." As the sparrow breeds three or four times a year, and as one pair may rear 20 young in a season, all of which are fed on food consisting of 50 per cent. of caterpillars and small beetles, 10 per cent. of other food not being accounted for, which we may assume to consist of aphides and other soft (undeterminable in crop of bird) insects, while 40 per cent. of the food is given as corn which is not attacked in growing crops until the latest broods are fledged, there is much to be said in favour of the sparrow as an insect-destroyer during the breeding season, though 40 per cent. of vegetable food represents destructive work on crops. This vegetable feeding-stuff must be obtained near the nesting places in farm-buildings, homesteads and adjuncts in rural, suburban, and urban districts, the birds being unmolested in towns, parks, and villages. In these places brooding sparrows must do much good by destroying innumerable pests, such as aphides on fruit and other trees and bushes, loopers and other

caterpillars, butterflies and their larvæ, click beetles, pea and bean weevils, though, according to some observers, the sparrows eat ladybird larvæ and beetles, as well as spiders, which are useful in destroying pests. Devastations of crops in gardens, fruit plantations, and vegetable grounds are limited to areas within a short distance of the harbouring and breeding places; therefore the occupiers are responsible for the havoc committed on their own or their neighbours' crops, and have the remedy in their own hands, inasmuch as from the fostering of the birds in towns and villages, about hostleries, stables, railway sheds, warehouses, out-buildings, farmsteads, etc., they there increase out of all proportion to the natural insect-food supply of the broods, and at their best are simply aids in repressing insect ravages, in consuming weed seeds, and scavenging, not substitutes for preventive and repressive measures on the part of cultivators in respect of their crops, and of scrupulous cleanliness in regard of dwelling and other building environs. That sparrows acquire new tastes in accordance with environment is not remarkable, but it is astonishing to regard them as existing solely for man's profit, and as such should discriminate between the friends and foes of his crops. This is the incubus of man, since he alone is responsible for upsetting the balance of nature.

House sparrows are somewhat difficult to scare, soon making themselves familiar with objects suspended over sprouting seeds, growing or ripening crops, such as the straw-stuffed, old clothed, ancient hatted man-like scarecrow once upon a time seen stood up in allotment ripening corn, also on sprouting seed-corn and "set" potatoes, sometimes with a rattle worked by a windmill-like contrivance, but not now much in vogue, for the simple reason that allotment holders very rarely grow corn for their own use and for pigs, so restricted are the crops through the injunctions on keeping swine near human dwellings, and the impracticability of growing corn in the environs of large villages, of towns, factories, railway stations, and warehouses on account of the sparrows reared and fostered in such places, including pheasant rearing and feeding grounds, also those of poultry-farmers, and from these places making descent on the ripening corn crops on allotments, small holdings, and fields. Even the smaller seeds and sprouting plants, with some growing-up plants must be protected from the sparrows and other sprouting seed-plucking up birds.

To prevent house sparrows, also chaffinches and green linnets, plucking up sprouting seeds, such as cabbage, radish, turnip, and other seeds and seedlings the very old *Feathered Potato* scare (Fig. 107, B) is of some service. It consists of a bent or long, straight, slender rod of hazel or other elastic wood, 4 to 6 ft. in length placed in the ground in a slanting direction, from the end of which a potato is suspended by a string (*q*), feathers of different colours being in-

serted in the potato after the fashion of a shuttlecock, and 9 to 12 in. from the ground. The wind keeps the scare more or less in motion, and by placing similar scares 6 to 8 ft. apart along a 4-ft. wide bed, when the seed or seedlings are usually sowed (s), otherwise

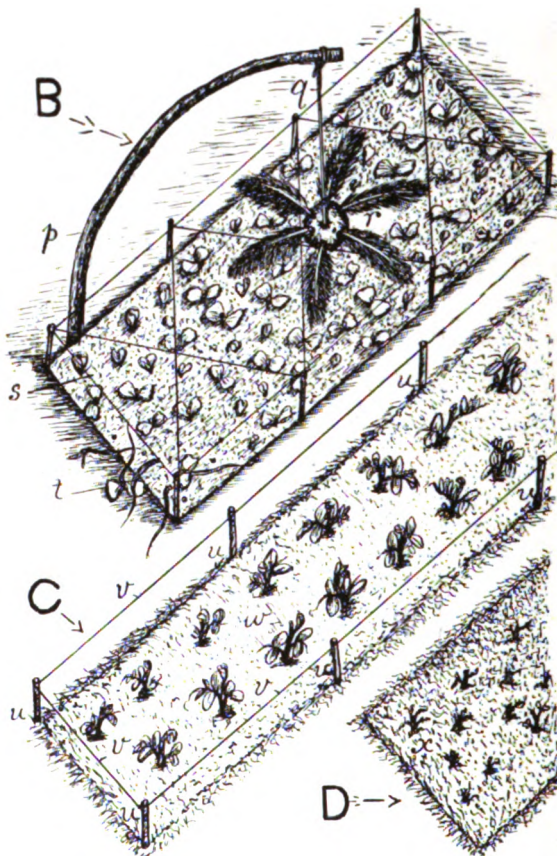


FIG. 107.—FEATHERED POTATO AND BLACK THREAD BIRD SCARES.

B, feathered potato scarecrow; *p*, bent stick; *q*, string affixed to stick and passed through potato so as to suspend it about 9 in. above ground; *r*, potato into which quill feathers thrust; *s*, normal seedling Brassicas; *t*, seedlings plucked up. The sticks and lines indicate protecting by means of black thread. *C*, black thread scare for rows: *u*, sticks; *v*, lines of black thread; *w*, undamaged pea plants. *D*, portion of unprotected row of peas: *x*, plants with tops eaten.

(late in applying) they may be plucked up (*t*). Black thread, however, is the best scare for sparrows, adjusted as shown in the illustration.

The *Black Thread Scare* (Fig. 107, *C*) consists of black thread

attached tightly to small sticks set upright in the ground about 4 ft. apart, and the lines not more than 1 to 2 ft. asunder, crossing the threads in the case of seed-beds diagonally. For rows of crocuses, polyanthus, carnations, etc., or peas, lettuces, winter spinach, beet, etc., it suffices to run the thread along the sides (*v*)

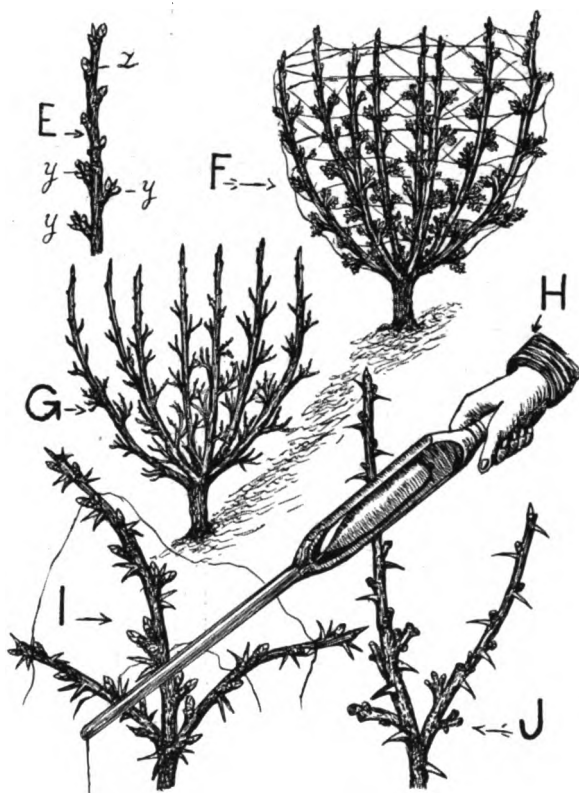


FIG. 108.—PROTECTING THE BUDS OF FRUIT BUSHES.

E, portion of a branch of red currant with buds intact; *y*, spurs, usually blossom buds clustered on a short stubby shoot with a growth bud in the centre; *z*, terminal growth (previous summer's) with growth (narrow and pointed) and flower-buds (short and rounded). *F*, red currant bush rough-webbed with black thread as protection against bullfinches and sparrows. *G*, red currant bush from which buds taken by birds. *H*, Rolfe garden webber. *I*, portion of a gooseberry bush with buds intact and lines of black thread. *J*, portion of a gooseberry bush from which the buds have been taken by birds.

just clear of the plants, and 2 or 3 in. from the ground. By those means the sparrows are frightened and the plants thrive (*w*); unthreaded plants adjoining are eaten off (*D x*).

Sparrows, also bullfinches, often denude gooseberry and currant bushes of the best buds. They may be prevented by running lines

of black thread lengthwise and crosswise of the bushes, but preferably on each bush (Fig. 108, F) forming large irregular meshes by winding the thread round the tips of branches, this so annoying the birds as to ward off their attacks. This can be done with great celerity by the *Rolfe "Garden Webber"* ("Stott" Company, Manchester), Fig. 108, H. The cotton unwinds as fast as the stick can be passed over the bushes—ten or more times as quickly as by passing the cotton through the fingers.

Bush and pyramid plum and other fruit-trees may be rough-webbed with black thread similarly to currant and gooseberry bushes to protect the buds from sparrows and bullfinches.

Sprouting peas are sometimes protected by *Pea Guards* made of $\frac{3}{4}$ -in. diamond mesh wire-netting galvanized after made, 3 ft. long, 6 in. high and 6 in. wide. In some cases mice are as troublesome as sparrows, when it may be necessary to use *Mouse Proof Guards*, the netting quarter-inch mesh. This mesh is also used for protecting seeds, such as those of the rose, from the depredations of mice, the guard being 12 in. wide and 6 in. high. What is known as a *Strawberry Guard*—a similar contrivance, but with an elliptic top, longitudinal and cross stays, $\frac{3}{4}$ -in. mesh netting, 6 ft. long, 1 ft. 6 in. wide, and 1 ft. high—is used for protecting carnation "grass" from the ravages of sparrows, and also utilized for keeping blackbirds from pecking ripening strawberries, also for protecting rows of winter spinach, lettuces, etc., from sparrows. These contrivances, however, are somewhat expensive in relation to the value of the crop, and can only be indulged in by persons not estimating crop value from a commercial point of view, or growing from the standpoint of utility.

For protecting blossom buds from the ravages of sparrows and other bud-destroying birds, Mr. William E. Bear, a fruit-grower for profit, uses the following, which he finds effective: 20 lb. lime, 50 lb. flowers of sulphur, and 75 lb. of soft soap in 150 gallons of water. The sprayings are recommended to be done so freely that the trees or bushes will be well coated, as if they had been white-washed with a brush. This is given as an example of the expense to which fruit-growers are put in order to protect their crops prospectively from the devastation partly, if not solely, due to toleration long ago overstepped in the case of the house-sparrow. Its reduction, therefore, to more reasonable numbers is essential to the successful practising of agriculture and horticulture, especially round villages and hamlets where small holdings are, or are likely to be, located, isolated farmsteads and holdings having the repressive measures to a greater extent in their own hands, though the migrations from town to country of sparrows in harvest time and sojourn there until late in autumn is well known. Any attempt at reduction must be thorough and embrace the whole country. It is little use killing sparrows in one locality, if they are allowed to multiply

in surrounding districts. Even the isolated farmstead fostering sparrows may be a serious cause of loss to the neighbouring farmer careful in destroying eggs and nests in the breeding season. In like manner a village or hamlet doing nothing but grumble may rear sparrows sufficient to re-stock neighbouring villages and hamlets where strenuous steps are taken by *Sparrow Clubs* to lessen the sparrow plague in their districts. But the great fostering places of sparrows are towns and centres of industry whose interests are alien to profitable agriculture and horticulture. Therefore, we propose that every *Parish Council* constitute a *Sparrow Club* with power to pay for eggs, nestlings, and adult or fledged birds, on similar lines to what obtained in most country parishes when, at the beginning and up to the middle of last century, the overseers or churchwardens paid for sparrows' heads and eggs. This must be imperative in all parishes of a district. Then the *District Council*, finding any special damage committed in a parish by sparrows on standing or unharvested corn crops, shall appoint a valuer to estimate the loss to the grower or growers, and the sum or sums agreed upon paid out of the rates. Thus village and town residents would be interested in keeping down sparrows and rendering it feasible to grow corn on village allotments and small holdings.

Village or District Sparrow Clubs may appeal to some persons as most appropriate, but what good are they unless embracing the parishes, and particularly those of towns, where the sparrows are reared, as well as those where they are held in check? A club in Kent, says a Board of Agriculture leaflet, with less than twenty working members, destroyed during the three seasons (1900, 1901, 1902) over 28,000 sparrows. The Witham (Essex) Sparrow Club closed the season 1906 with a record of 36,541 sparrows killed. Three members contributed 3,000 birds each.

Of course, such results are obtained by legitimate means, such as destroying eggs and nests in the breeding season, the use of nets, chiefly "clap" and "purse," on dark nights around ricks, ivy-clad houses, and evergreen bushes where the birds roost, and by shooting flocks as they rise from standing, ripening corn, or aggregations in stubbles and about outlying corn-stacks, as well as about farmsteads, poultry-yards, etc., during the winter.

Poison, particularly poisoned wheat, is not allowed by law to be used for destroying sparrows or other birds, though Mr. F. Smith in his paper on "*The Fruit Grower and the Birds*," says:

"For reducing the number of sparrows the best thing he has known was Harding's prepared wheat. It would not kill anything larger than a sparrow or mouse—it would not kill rats or poultry. But the Government of the day brought in a Bill making it illegal to poison wheat in any way. Still something might be done by appointing a certain number of men to kill sparrows by this means by permission of the Board of Agriculture."

Notwithstanding legislative enactment, poisoned wheat is used for destroying sparrows, and not only by those evasive of law through privacy of location, but with countenance of persons wishful of small bird riddance, as shown by the following excerpt from the *Daily Chronicle*, April 30, 1907 :

PROFESSIONAL BIRD POISONER.—“At Fakenham, Norfolk, yesterday, Robert Bullen, who was described as a professional poisoner of birds, was sent to gaol for fourteen days in default of paying a fine and costs for laying grain steeped in strychnine on three farms. In one instance a barrowload of dead birds was gathered up. Bullen said ne had eaten thousands of poisoned birds and taken no harm. He also said he had been in the business for twenty-five years without complaint. The farmers, who pleaded ignorance of the law, were also fined for allowing the practice.”

In the United States of America the sparrow is regarded as a grievous pest, and the following poison advised to effect its destruction as “a pest all the world over” :

“*Poison for English Sparrows.* Dissolve arsenate of soda in warm water at the rate of 1 ounce to 1 pint ; pour this upon as much wheat as it will cover (in a vessel which can be closed so as to prevent evaporation), and allow it to soak for at least 24 hours. Dry the wheat so prepared, and it is ready for use. It should be distributed in winter in places where the sparrows congregate.”

Of course, this poisoned wheat, as also that steeped in strychnine, implies baiting the birds for a few days before laying the poisoned article, and there is this disadvantage in recourse to poison, that it kills both foes and friends, whereas *Sparrow Clubs* conducted on intelligent lines make the distinction.

TREE SPARROW. In comparison with the house sparrow this is of small economic importance, though often mistaken for the latter on account of its almost exclusively nesting in trees. House sparrows, however, are great tree-nesters, making nests in trees by farmsteads, rural, suburban and urban dwellings and buildings, in preference to places where likely to be disturbed by cats or destroyed by human beings, a notable example of this being seen in house sparrows selecting a large Monkey Puzzle tree (*Araucaria imbricata*) by a farmhouse for nesting in preference to all other trees in the vicinity, probably their “reasoning” that cats are not seen after birds on that tree. The large nests and litter made by house sparrows on trees are great eyesores and detrimental to the health of the trees, therefore they should be pulled off whilst the birds are brooding so as to destroy the eggs or young, a pole with iron hook securely fixed to the top end being used for the purpose. Tree sparrows make a much neater nest, and usually some distance from dwellings, far more isolated and every way less social in habits than house sparrows, and more insectivorous in feeding, especially their young. As a rule, they are not so numerous as to call for any

repressive measures, but we urge the destruction of all sparrow nests in trees in the best interests of the aboriculturist.

In recent years pheasant-rearing fields and concomitantly pheasant and other winged game feeding-places, also poultry-rearing grounds and farms, have been greatly multiplied and extended, so that sparrows have been encouraged in localities where not formerly noticeable and destructive, and from necessity of circumstances nesting and roosting in trees; therefore regarded by not a few persons as *tree* sparrows. So great nuisances do these become that gamekeepers and poultrymen have recourse to trapping with some success, though sparrows, whether *house* or *tree*, are ever wary, and soon learn by fate of victims to keep clear of the cleverest devices.

One of the most useful traps is the wire cage, Fig. 109, consisting of light iron frames covered with galvanized wire-netting.

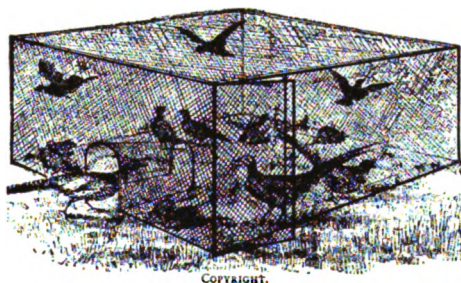


FIG. 109.—BOULTON & PAUL'S WIRE CAGE OR TRAP.

It is made in three sizes, No. 2 being the one suitable for sparrows. It is 3 ft. 6 in. long, 2 feet, 6 in. wide, 2 feet 6 in. high, and covered with $\frac{3}{4}$ -in. mesh netting. There is a pocket or mouth (the trap may be made with a mouth on each side instead of one) by which the birds enter, and so constructed that they do not appear to be able to find the outlet, a very small percentage escaping. Before setting the trap the ground should be well baited with hempseed and the top left off so that the birds may feed inside as well as about the frame. When the birds are freely using it, bait well inside and put on the top and cover it with dry fern or fir-boughs, to make less conspicuous, sprinkling a little bait around outside. If placed where sparrows congregate, large numbers may be caught, more especially the young birds in May and June, and in frosty weather, and other harmless birds being caught they may be set at liberty unhurt.

THE BUNTING. Inflicting some damage on corn crops, this bird is more or less injurious to the farmer, but, esteemed as a delicacy for the table, is not likely to increase inordinately. The capture of buntings is effected by dragging a long net of a certain con-

struction, called a "draw-net," over stubbles at night, and in sharp weather by hair nooses attached to string and affixed to pegs over a trail of small seeds or corn "tailings."

The **YELLOW-HAMMER**. In proportion to its numbers the yellow bunting takes toll of the cornfields, and is one of the many grain-feeding birds encouraged by "pheasant-feeds" in woods, and increased in consequence of the destruction of hawks. Shooting, in addition to the other means mentioned for the corn-bunting, is the usual practice in keeping down yellow-hammers, especially when on wing in rising from the ripening or ripe corn.

The **FIELD or SKYLARK**. This bird is wholly supported by the produce of the field—lowland and upland pastures and meadows, including rotation grasses or "seeds," with clovers and other legumes, taking toll when opportunity offers of pilfering seed-corn and sown-seed generally, while feeding largely upon the leafage of the nitrogenous legumes. In return for this forage the lark probably compensates by the consumption of weed-seeds and weed-herbage, along with decimation of insect pests feeding upon useful crops. But the farmer, instead of requiting himself for the keep of the larks, relegates the profit to bird-catchers—lowland men dragging a draw-net over the marshlands and fields, and hillmen, setting horsehair nooses on downs, thus capturing the larks reared

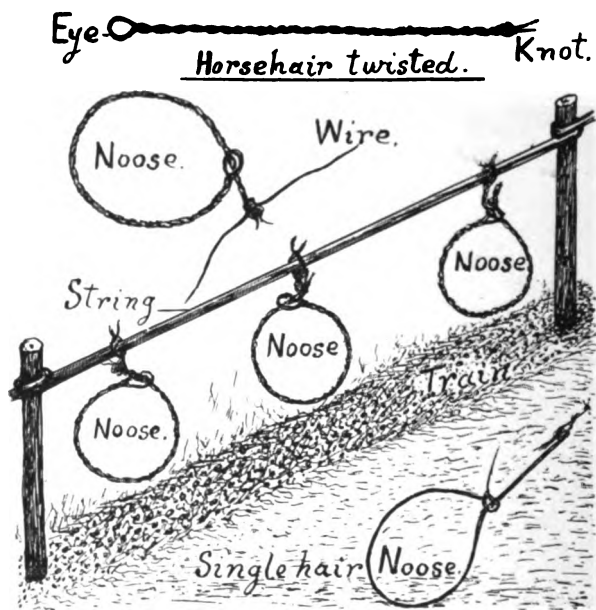


FIG. 110.—THE HORSEHAIR NOOSE.

at the expense of the farmers in the country generally, taking no account of the migratory birds that flock to this country or southward in autumn and winter, and thus placing the lark in the London and other markets in the prime condition, to the main advantage of the retail sellers.

The horsehair noose, Fig. 110, by which larks are captured is formed of a dark, preferably black, horsehair, and about 2 ft. long. It is doubled and held between the right-hand finger and thumb leaving a little loose loop of about $\frac{1}{2}$ -in. long. From this point the hair is twisted up by an overhand motion of the thumb. On reaching the bottom a knot is made to prevent it unrolling, then pushing the knotted end through the eye of the loop a loose noose is formed. A piece of wire attached to the free end of the noose by a twisted loop renders it complete. By means of the wire the noose is readily affixed to a whipcord string, stretched by pegs about 4 in. from the ground over a train of "hinderends" from the thrashing machine, the noose being so placed that a lark passing under is caught by pushing its head through the hanging noose. The line of nooses is more "deadly" if set at the edge of the train and has a companion line on the other edge. This snaring of larks is carried on in severe weather, especially when the ground is snow-covered. The nooses are affixed to the line as close as they may well be, so that while some larks are caught by the neck in reaching the food, others get their limbs entangled in the nooses; setting is evening, and collecting, early morning work, or varied according to circumstances.

Larks are sometimes decoyed by a cylinder of wood inlaid with pieces of looking-glass fixed between two uprights, and made to revolve by means of a small crank and wheel, to which a line is attached, and nets set between the uprights. The fowler retires to some distance, keeps the cylinder in constant motion by pulling the line, and with his mouth keeping up a soft whistling noise. The larks flutter over the twirler, see themselves, and dazzled, descend to the ground between the nets, which are then pulled over by the netsman.

Draw-net capture of skylarks is sometimes had recourse to by fenmen in autumn and early winter, the knolls on which the larks roost being noted (by their droppings) in the daytime and the dragging effected at night.

BULLFINCH. This bird has not one redeeming feature save its appearance in the estimation of the fruit-grower, for the devastation caused after Christmas on the swelling buds of fruit-bushes and trees until the buds expand into leaves. The worst time is February and March according to locality. It usually commences with the gooseberries, red and white currants, not black, as a rule, and follows on with plums, notably greengage and all the gages, early Rivers, black diamond, and prune damson, indeed all plums

and damsons, cherries, particularly "May Duke," sometimes in autumn or early winter, apples, notably "Councillor," and medlars, attention being also given to pears and sometimes black currants. The bullfinch also attacks the buds of the sloe and bullace, birdcherry, hawthorn, larch and beech in their order of swelling, and for about six months lives almost entirely on fruit buds. It also takes some ripe raspberries, blackberries, hips and haws, privet and rowanberries, chiefly for the seeds.

As "set-offs" against the bullfinch depredations in gardens, fruit-plantations and orchards, six months' feeding on various weed-seeds, such as chickweed and groundsel in flower-bud, sow-thistle, plantain, dock, ragwort, thistle, nettle, and knapweed, have to be considered, and also insect-food of the young bullfinches. On the question of utility in these respects the valuation by fruit-growers is that many seeds of weeds pass through birds undigested, and these seeds are distributed by the birds, while in the matter of insects forming the chief support of the young of the bullfinch, it is contended that they are fed on seeds softened by their parents and in forgetfulness of the latter not "softening" weed-seeds for their own use.

The bullfinch is somewhat local in distribution and most plentiful near woods protected by game preservers, where it multiplies in safety, and this accounts for its comparative abundance and even increase in certain districts. During late summer, autumn, and early winter, bullfinches rove about in families of five or six. At these times they may easily be caught in a trap-cage (Fig. 111), with a "call bird." Captured in this way, the plumage of the birds assures for them a ready sale, particularly as they are easily tamed, taught to pipe, and even to articulate words. Accomplished in these respects, they are sold at high prices, as much as £4 or £5 being demanded for a single bird.

After the birds pair the call-bird of the trap-cage has little allurements on any bullfinch but the unmated. At this time, a pair only do immense mischief in a garden, fruit-plantation and orchard, practically rendering the bushes and trees fruitless through taking the buds. The birds may be secured by means of birdlime, which is made either from holly-bark or from boiled oil.

Holly-bark birdlime is "usually prepared by boiling holly bark ten or twelve hours, and when the green bark is separated from the other, it is covered up for a fortnight in a moist place, then pounded into a rough paste, and washed in a running stream till no motes appear. It is next put up to ferment for four or five days, and repeatedly skimmed. To prepare it for use, a third part of nut-oil or thin grease must be incorporated with it over the fire" (*Encyclopædia Britannica*).

Linseed oil birdlime is prepared by placing linseed oil in an old pot or vessel that will stand the fire without breaking, and not more

than one-third full. Place it over a slow fire and stir it until it thickens as much as required, which is ascertained by cooling the stick in water and trying if it will stick to the fingers. When sufficiently boiled, pour into cold water and it will be found ready for use. About four hours of slowly boiling are required for the oil to become sufficiently tenacious for use.

When birdlime is about to be applied or used, it should be made hot, and the rods or twigs should be warmed a little before they are



FIG. 111.—THOMAS & CO.'S¹ DOUBLE CAGE TRAP.

dipped in it. In order to prevent birdlime from being congealed by cold, it should be mixed with a little oil of petroleum. The common kind of bird-lime must be melted over the fire with a third part of nut-oil or any thin grease, if that has not been added in the preparation.

In lining for bullfinches without a call-bird, the main branch of any bushy tree, with long, straight and smooth twigs, such as the birch and willow, should be cleared from all the useless spray; then lime the branches to within four fingers of the bottom, leaving the stem from which the branches spring untouched, and then place the bush where the birds resort, and so as to be above the bushes of gooseberries if placed there to capture the depredators on the buds.

For taking the smaller kinds of birds other than bullfinches and

¹ 360 and 362, Edgware Road, London, W.

other bud-destroyers during frost and snow, when all sorts of birds assemble in flocks, birdlime may be used in various ways; the linseed oil prepared birdlime should be put into an earthen vessel with one-fourth of its weight of fresh lard, and the whole melted gently over the fire. A quantity of wheat-ears with about a foot of the straw attached being cut, proceed to lime the stems about 6 in. in extent from the bottom of the ears, and stick the limed straws into the ground on a train of chaff and threshed ears over ten or more yards length, with the ears inclining downwards or even touching the surface. A person traversing the adjoining places will make them fly towards the train, and finding "meat" will soon commence picking at the ears of corn and become so entangled and held by the limed straw as to be easily taken with the hand. In the case of out-lying corn-stacks, limed twigs, as advised for bullfinches, may be stuck in hedges near-by, or in a train of chaff and thrashed ears of corn on the ground, sparrows and other corn-eating birds being thus easily captured. Even on allotments, small holdings and farmers' cornfields, sparrows and such-like depredators may be greatly restricted by bushy trees limed as described and stuck in the ground or affixed to poles so as to be just above the corn where the depredations are being carried on, or at the points whence the attacks are usually made. A preparation to use for this purpose, also against bullfinches, is a mixture of resin and sweet oil, two-thirds of the former melted, and one-third of the latter. Even of this consistency, the birds getting it on their legs and wings are greatly prevented from further devastation; while made stronger by using less oil in the preparation, they are "stuck fast," or so besmeared as not to give more trouble.

LIMEWASH, made from quick stone-lime with water to a consistency easily applied by means of a syringe when strained, is an effectual means of preventing bullfinches taking the buds of fruit-bushes and trees. It must be applied in good time, thoroughly coating the whole of the bushes and trees, and only made from quicklime, otherwise it will not adhere to the buds, using as soon as prepared. This may be repeated if necessary, and besides preventing the buds from being taken, will free the bushes and trees of overgrowths of lichen and moss, hibernating pests, and profit the plants when fallen off and mingled with the soil.

TAYLOR'S DRESSING as a preventive of birds taking fruit-buds: "Take a quarter-peck of quite fresh quicklime, choosing the lightest lumps, a pint of flowers of sulphur, and $1\frac{1}{2}$ lbs. of soft soap. Dip a few of the lumps in or sprinkle with water (hot water is the quickest in action) and place in a bucket or other vessel; sprinkle a little of the sulphur thinly over it, then add more lime, just damp enough to slake; then add more sulphur on the top of it, repeating this process till all the sulphur is used. The quantity of lime

used is not important so long as there is sufficient to dissolve the sulphur, which gives a dark colour to the lime. The soft soap should be dissolved separately, and afterwards mixed with the lime and sulphur, and sufficient water added to make 3 gallons in all. If the mixture is not thick enough to apply with a brush more lime may be added, or if the glaring colour be objected to, mix soot with it. Caution must be had in dissolving the sulphur, not doing it in a house containing plants in a growing state, as the gas emitted will burn up every leaf just as completely as if fire had been used. The mixture is applied by means of a brush, well coating all the parts of the bush or tree, taking care that the buds are not injured or dislocated. It may also be dashed amongst bushes with a whitewash brush, or made thin enough to be passed through a syringe. Birds will not touch buds that are well coated with the mixture, and no amount of rain will wash it off if it be applied in dry weather, but this is contingent on its being prepared with quicklime, for if lime is used that has been some time exposed to the air, the sulphur will not properly dissolve, and the first shower will wash it off."

WOOD-PIGEON. Under this term is included the ringdove or cushat and stockdove. Both are destructive to vegetable crops in gardens, fields, and woods. In gardens they feed upon the leaves of cauliflowers and other brassicas, tops of sprouting peas and sometimes ripening seed, and leaves of beets and lettuces. In the fields they feed upon young growths of clovers, peas, and vetches, also their seeds, young growths of turnip-tops, indeed most brassicas, and grain. In the woods they feed on acorns, beech-mast, seeds, buds, catkins of trees, and by their weight break the leaders of larch, silver fir, spruce, and other conifers, especially on the east coast by the immense flocks that arrive in winter from the Continent. These, although smaller, do most harm in woods and fields, often clearing a whole field of turnips or cabbage, etc., of their tops. Wood-pigeons are also said to eat cherries from green to ripe, and take gooseberries whole.

It is straining matters too far to say wood-pigeons are of no use and that they are entirely vegetarians, for their food, though mostly grains, seeds, and greenstuff, is varied with a dietary of mollusca, such as slugs, etc., and they also devour various weed-seeds, such as charlock, wild mustard, etc., along with wild herbage and roots. Of the latter mention may be made of the Pilewort (*Ficaria ranunculoides*), the crowfoot-like roots of which wood-pigeons bill out of the ground in winter and eat with great avidity; hence it has been advised to encourage this plant in the vicinity of gardens to prevent wood-pigeon depredations in winter.

Of the wood-pigeon's value in a pie and of importance to game preservers there is no question, being good as food and worth 1s. per brace. The close preservation of game implies encouragement

of wood-pigeons and their serious increase in some districts. In Devonshire the farmers' wood-pigeon crusade resulted in 6,000 of these birds falling a prey to the gun in a season. This represents something more than £150 compensation for damage already

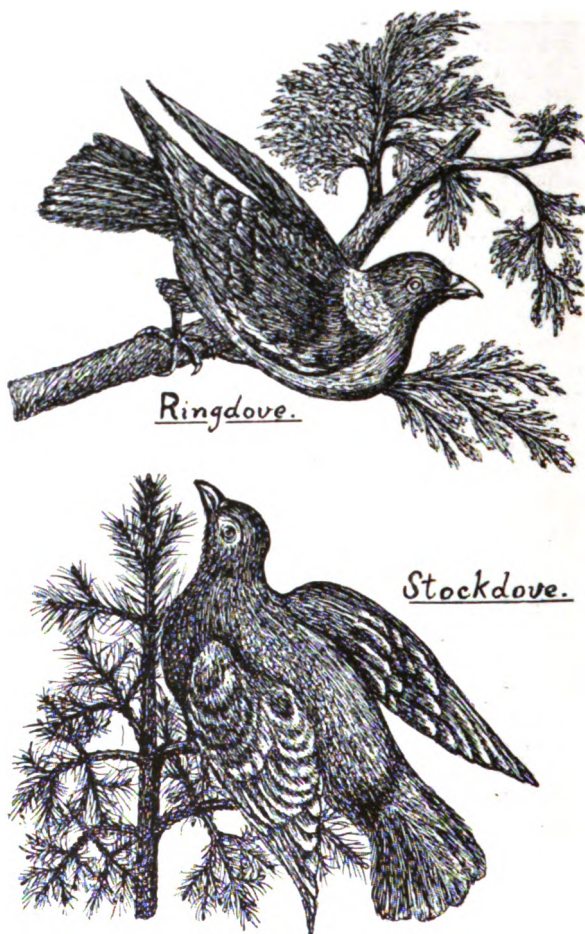


FIG. 112.—THE RINGDOVE AND STOCKDOVE.

inflicted, inasmuch as the crusade is a clear intimation to game preservers that wood-pigeons must be decreased in numbers, otherwise farmers recoup themselves for the losses incurred by their depredations on crops. The restriction by gun, however, except on trains, such as gamekeepers make in woods during hard weather

in winter, and particularly during the shrouding of the ground in snow, is not very drastic, as the birds are singularly wary and not easy to come at within gun-range; even then a good shot is not always sure of killing and dropping on his ground. On a train in a wood as many as twenty-six wood-pigeons have been killed or wounded, so as to be captured, by one discharge of the gun. This indicates the advantage of the train of the gamekeeper over the farmer at the latter's expense.

As trains are hardly feasible in fields owing to the difficulty of securing concealment for the gunner, the following method for capturing wood-pigeons may be adopted :

"In a small field, about 100 yards from the hedge, make an enclosure of wire-netting, say 20 ft. by 12 ft. and 6 ft. high, more or less netting also over top, with a door so constructed than when pulled by wire it easily drops shut. Sprinkle maize about door and close to inside for several days until pigeons come readily to feed, in the morning mostly, and have got accustomed to feed inside enclosure, then the watcher pulls wire and you bag the lot. Choose a field with a high hedge or other cover sufficient to hide the person who drops the door."

Obviously this trap would be improved by having a door at both ends and one or more at each side, and so contrived that when a catch or catches were liberated by one pull of the wire all the doors quickly drop shut. Possibly tanned netting affixed to portable iron standards—as employed for boundaries of lawn-tennis coverts and netted over top when about to catch, leaving open whilst baiting, the open ends being closed by the dropping of poles with netting affixed—would answer in places where concealment for the wire or cord-puller was present is provided.

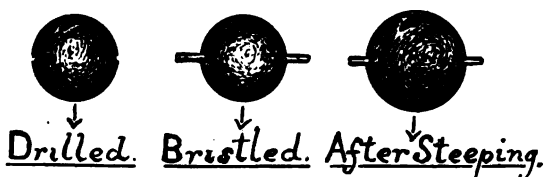


FIG. 113. THE BRISTLED PEA.

A gamekeeper advises the "bristled pea," Fig. 113, for capture of wood-pigeons by hand as follows: "Drill a hole through a pea, field-pea for preference, with a "bit" so fine as to make a hole through to admit a bristle and standing out on both sides about $\frac{1}{4}$ -in. Steep the peas so prepared overnight in warm water, and the ends of the bristles not projecting more than $\frac{1}{4}$ -in., they are ready for use, otherwise shorten to that length. With a number of such bristled peas scattered on a train that has been well baited

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and the wood-pigeons accustomed to feed, the catcher awaits in ambush the coming of the birds. A wood-pigeon picking up a bristled pea tries to swallow it, when the bristle ends stick in the throat, and the bird is so anxious to get the pea up or down that the person in ambush may readily do the rest." Of this plan we have no experience, but the inventor vouches for its effectiveness, and it certainly has a "look" of usefulness for using in winter time in a turnip or cabbage-field to lessen the plague of wood-pigeons that reach Britain from the Continent.

On freshly-sown corn, the "bristled pea," or maize would probably be objected to by game preservers, also the spring trap, which is not allowed by law to be set in the open, though it frequently is, and all goes smoothly unless winged or ground game are victimized. In gardens, private or market, allotments, and small holdings, there is little dread of game being endangered, and even in fields it is very rare that either winged or ground game come to grief, apart from the game preserver's imaginary captures. Amongst fresh-sown corn or seed of any sort, and amongst young plants, wood-pigeons are perfect gourmands, and a stop, game or no game, must be put to their depredations. For this purpose we commend the Wire Spring Rabbit Trap (Fig. 114), with spring of medium strength.

The great consideration in connexion with the spring trap in this relation is the closing of the jaws, whether notched or flat, for if they close within an eighth of an inch, or quite close, the leg of the pigeon caught will simply be cut off and the bird will fly away. To obviate this, string may be bound round the jaws, each turn lying in a notch, tarred string being used. The trap called "Humane" with india-rubber ribbed covered jaws holds the leg without breaking it. Of course, if the plate of the trap is baited with some corn, the pigeon is caught by the neck and soon dies, so that the jaws of the trap are not of such importance as for leg trapping.

In newly-sown cornfields wood-pigeons usually make miniature clearings of circular form, the centre part being more divested of corn than the outer. Traps should be set about these clearings about 2 yards apart, and covered over with soil, hiding every part of trap, including the fastening. If baited about six grains of corn will need to be placed on the table, with a few here and there round about, though some trappers make a point of picking up grain within a yard of the trap.

When a bird is caught, the remainder not in the same predicament will take their departure with great promptitude. The traps should be visited about the middle of the forenoon and again as the day begins to wear off. If the wood-pigeons take to another part of the field, which is very unlikely, unless a large one, traps should be set there. Rooks may be trapped on newly-sown corn in the same way as wood-pigeons; but as they roam more about the field than the latter, the traps must be more widely distributed

and more of them set. The traps should be baited so as to take the rook by the head, for when caught by the leg the bird does not stop struggling until away or dead. Nothing scares wood-pigeons and rooks so much as capturing a few of them in traps, so that when either or both are troublesome, trapping should be had recourse to in a

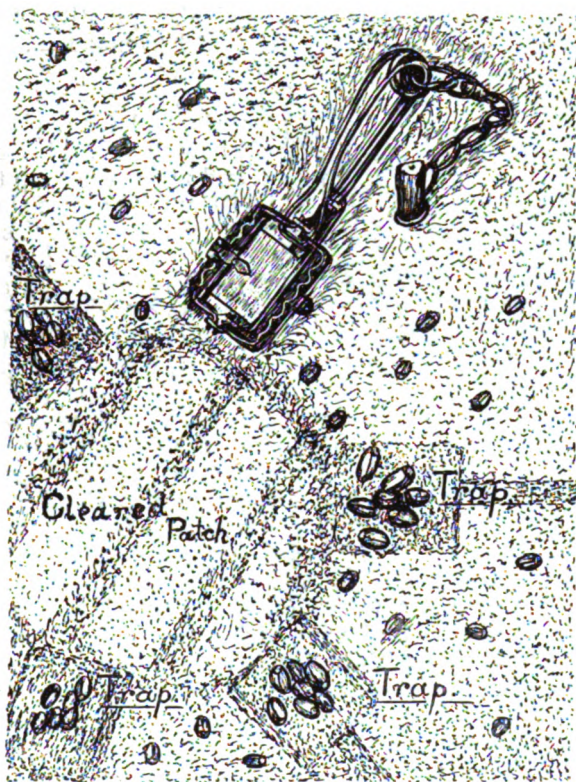


FIG. 114.—LANE'S WIRE SPRING TRAP SET FOR WOOD-PIGEONS.

similar way as on newly-sown corn, setting several traps at the outside of the centre or centres from which the birds work and near by the unpecked plants.

But trapping in not a few cases is objected to under absurd conviction of game-preservers that only winged or ground game capture is the sole object of setting spring traps in the open; therefore, under such circumstances, recourse may be had to protecting young cabbage, cauliflower, and other brassica-plants, also peas and other legumes, with beets and other plants, the treated parts of

which are not to be used for salad, or forage, or cooking, by spraying seedlings when springing and above ground, also newly-set plants, with Paris green, $\frac{1}{2}$ oz. in paste form (Blundell's being the best make) and 2 oz. of quicklime slaked and formed into a milk with water and straining through a fine mesh sieve (to free it from undissolved particles likely to clog the spray-nozzle) into the vessel containing the Paris green paste diluted with a similar quantity of water as used for the "milk" of lime, stirring and adding 1 lb. of treacle dissolved in a gallon of water, then diluting to 12 gallons for use. If applied by a syringe with a spraying nozzle, an assistant should stir the mixture while the spraying proceeds, and for applying by a knapsack machine the mixture should be well stirred before charging it; then the action of the person and pump will keep the Paris green in suspension, this being all-important for an equal distribution of the poison on the foliage in the finest possible films. If the mixture is made much stronger damage to the crop ensues. The treatment answers equally well against house sparrows attacking pea-plants when springing from the soil, also other vegetable crops; but the mixture must not be used on any plant that in the parts treated will be wanted for salads, cooking or forage for at least a month after treatment.

DESTRUCTIVE TO GAME, POULTRY AND PIGEONS

SPARROW-HAWK. No bird has a worse character among game-keepers, poultry-breeders, and pigeon fanciers than this, for it takes young partridges, pheasants, hares and rabbits, chickens and pigeons, and is inconsistent with the game, poultry, and pigeon industries.

However, the forester, farmer (apart from poultry and pigeons), and gardener see no bird with higher qualities for killing mice and voles and insects, such as the crane-fly, small birds, especially chaffinches, green linnets, blackbirds, thrushes, and wood-pigeons, and in these respects is invaluable, as, according to W. Swaysland, a sparrow-hawk destroys on an average three birds per day, and this gives a total of over 2,000 birds annually for every pair of sparrow-hawks. But what of the titmice, wrens, and other more or less insectivorous and weed-seed destroying birds! Surely in this respect the sparrow-hawk is injurious! Though called sparrow-hawk, how many sparrows does it destroy, and to what extent is its presence beneficial in scaring birds off ripening corn?

The sparrow-hawk, all points considered, has no place in cultural utility, and in the interests of the game-preserver and poultry-farmer, also pigeon-breeder, must be kept within bounds if these highly desirable pursuits are to be followed successfully in the best interests of the nation, alike from the standpoints of pleasure and of food.

Though the sparrow-hawk is most destructive during winged-

game rearing time and also to chickens at the nesting period, when the birds are readily shot, it is ever prone to swoop down upon pigeons and young poultry, on or about dovecotes, in stack-yards and poultry-yards, and upon game, when the gun has little chance of being effective; therefore recourse is had, albeit illegal, to trapping.

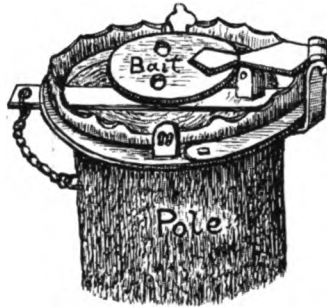


FIG 115.—HAWK OR POLE TRAP.

The trap usually employed for the sparrow-hawk is circular, 4 to 6 in. in diameter and made with or without teeth; there is also a humane hawk-trap of which the rasped jaws are protected with india-rubber for catching the bird alive without injuring it. The trap is placed on a pole standing about 6 ft. out of the ground and firmly fixed upright, placing 2 ft. in the earth, selecting a place over which the hawk beats frequently. A small bird or piece of meat is secured by fine wire on the plate as bait, and the hawk seeing it, swoops about, and after sundry feigned darts makes a full venture and is caught. Fluttering and screeching ensues, the trap, secured to the pole, falls and the hawk dangles in the air.

HEN HARRIER. This bird is a terror to the moorland game preserver, and the only advantage that it confers is on those cultivating the soil, always providing the pursuits are not intensive and embrace the dovecote and poultry-yard. This, and other large hawks may be trapped by first capturing their young and pegging one or more to the ground, and surrounding it or them by concealed traps, such as the *Large Hawk Trap* with 5 or 8 in. jaws, fitted with double springs and setters. This highly-effective mode succeeds by reason of the old birds seeing or hearing their "cry," and attempting to release them. In like manner, if part of a bird or animal killed by a hawk can be found, and this surrounded with concealed traps, capture usually results, as the hawk usually returns, sometimes after the lapse of several days, to finish its meal.

The **GYRFALCON** and the **GOSHAWK** are so rare in Britain that the sight of either or both suffices to bring out expert shooters, even amongst foresters, farmers, and gardeners, who in sentiment are

loud in acclaiming against the destruction of hawks and owls and in practice lose no opportunity of killing them, and either for gain or self-gratification employ the taxidermist. Trapping, therefore, in the case of these birds, and also kite and buzzard, is seldom requisitioned, for their havoc among game, poultry, and pigeons is so pronounced and their prevalence so uncommon in other than wild districts as to be regarded more as objects for the gun than the trap.

OWL. The *Long-eared Owl*, the *Tawny* or *Brown Owl*, and owls generally are sometimes classed by gamekeepers and poultry-farmers among winged vermin, but, except where extensive rearing of game and poultry obtains, we think unjustly. True, an owl acquiring the habit of taking a young partridge, pheasant, or chicken from the pheasant and poultry-rearing grounds will come again and again, and also make recurrent visits to rabbit-warrens and carry off the young rabbits in the dusk of the evening and at dawn of day. Under such exceptional circumstances the bird so offending must be shot, otherwise the depredations will be continued indefinitely, and probably lead to others of the same ilk contracting similar habits—the taking of food easiest procured. But owls, as a rule, feed mostly upon the four-footed and two-legged denizens of the woods, fields, and gardens classed as destructive to the crops of the forester, farmer, and gardener. In 210 pellets of the Tawny Owl, which bears the worst character for poaching, Dr. Altum found the remains of 1 stoat, 371 mice, 40 moles, 18 small birds, and many beetles. With this record justification is given for the insistence on owls being unmolested, even by the game-preserve and the poultry-farmer, who should remember that the owls in this connexion are night-birds, and when they are abroad the young birds, game and poultry, should be safe under the hen, also that for an occasional taking of a young pheasant, rabbit, or chicken, the immense destruction of mice, etc., more than counterbalance.

CARRION CROW. This cunning bird is one of the greatest enemies the gamekeeper and poultry rearer has. It is not easily distinguished from the rook, although differing in its flight and habits, and also lacks the light beak and white colour on the face of the rook. Carrion crows are generally found in pairs, though sometimes a flock of four or six are seen together. They pair in March, and in the early mornings especially must be carefully watched, for nothing in the way of eggs and young birds comes amiss to them. To trap them, a stale pheasant, or partridge, or hen-egg, according to place of depredation, or, better still, two or three eggs, will prove the best bait; pieces of high meat, rabbit paunch, or a small rabbit paunched and split in half are also attractive. The traps, same as those used for wood-pigeons, should be set round the bait, or in front; two or three traps if the bait is placed on a hedge near favourite haunts

of the birds. Flesh-bait should be firmly secured to the ground by wire pegs so that it cannot be moved by the bird. Small pieces of high meat tied on the plate of half a dozen traps, which are scattered pretty thickly and concealed all but the bait, are efficacious for taking crows across the head. The best spots for trapping crows are narrow belts of plantation, or at the sides of streams and lakes; or in coverts where there is not much underwood and which are a little open above, in fields, by fences or near a few shrubs or trees. If setting in plantation, choose a rough tuft of grass;

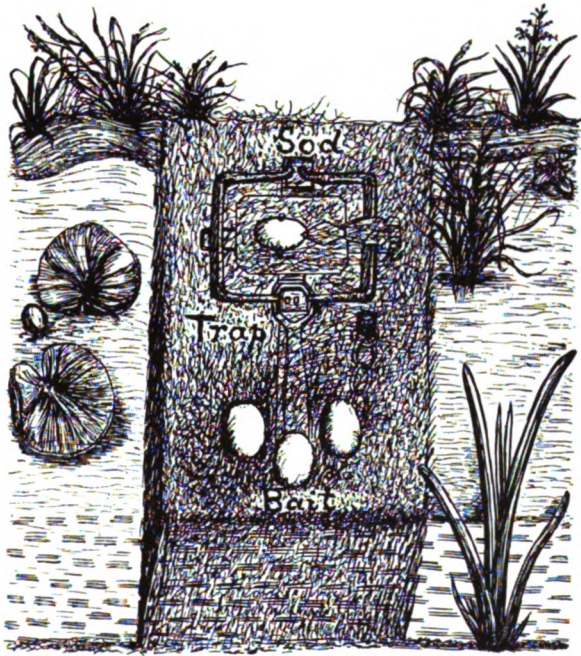


FIG. 116.—TRAP SET FOR EGG-STEALING CROWS BY WATER.

divide the grass at one side of the tuft, and at the point of the angle place the bait. Set the trap, "tickle," at the entrance and 4 to 5 in. from the bait, covering the trap and space around with withered grass cut small with a knife. For setting at the side of a stream or pool of stagnant water, cut a sod broader than the trap and place it in the water so as to project about 1 ft. from the side and almost level with the water, and placing the bait (egg-shells filled with moist clay) at the water end, and the trap 6 in. from the bait, covering the trap with "cut up" dead grass. Carrion crows may be killed by placing a bait half hidden on a piece of ground made

plain in a ploughed field and two or three traps set near it. The edge of a manure heap does well either for taking the crows by the head or leg. Of course, a keen search should be made for the nests of carrion crows, and these promptly destroyed.

HOODED CROW. This bird lives much in the same manner as the carrion crow, feeding on garbage of all kinds, eggs, young birds, feeble adults of both bipeds and quadrupeds on moors, preserves, warrens and pastures, and, like the rook, not sparing seed-corn and set-potatoes. It may be destroyed by the various methods of trapping described under carrion crow. For crows in the open, as on moors, a fresh sheep's head, fixed to the ground or a tree is a good bait. The head may be surrounded by traps, or poison may be introduced into the eyes. Attacks on seed-corn may be mitigated by setting traps, baited or left to take their chance; and attacks on set-potatoes are warded off by trapping, a few traps baited and judiciously placed having a good effect in a day or two.

AQUATIC OR WATER BIRDS

RESIDENT

INSECTIVOROUS AND HARMLESS

WAGTAIL. The five species of Water Wagtails or "Dish-washers" found in this country are all beneficial to arboriculture, agriculture, and horticulture, because their food is for the most part of a "soft" character, comprising insects of many kinds and in their respective stages. For this reason alone, apart from their harmlessness to crops, they deserve the strictest protection. In the Wild Birds' Protection Act of 1880 they do not figure; but in several counties in England, Wales and Scotland some of the species have been added to the schedule. The eggs are protected, under the Act of 1894, in a few English counties. This should be extended to the whole of the British Islands, and also to the young and adult birds, so that their beneficial work of destroying beetles, flies, moths and aphides, as well as millipedes, snails and slugs, may not be impeded, particularly as by destroying fresh-water molluscs good service may be done to sheep farmers and breeders in respect of the liver-fluke.

DIPPER. This bird is so uncommon and so little injurious, if at all, to fish, while acting beneficially by destroying larvæ of insects, as to claim complete protection. In the north of Scotland it is considered a fisher.¹

¹ In one Highland district 548 birds were destroyed in three years, a reward of 6d. per head being given.

PARTLY USEFUL AND PARTLY INJURIOUS

KINGFISHER. There is no question of this beautiful bird living chiefly upon fish, and of its destructiveness at fish hatcheries; therefore Fish Preservation Societies scruple not to destroy it. This is effected by the Kingfisher Trap (Fig. 117). In setting, screw the trap to a stump in the water where the birds resort, place a piece of wood on the fork for them to alight on, or bait with a small fish.

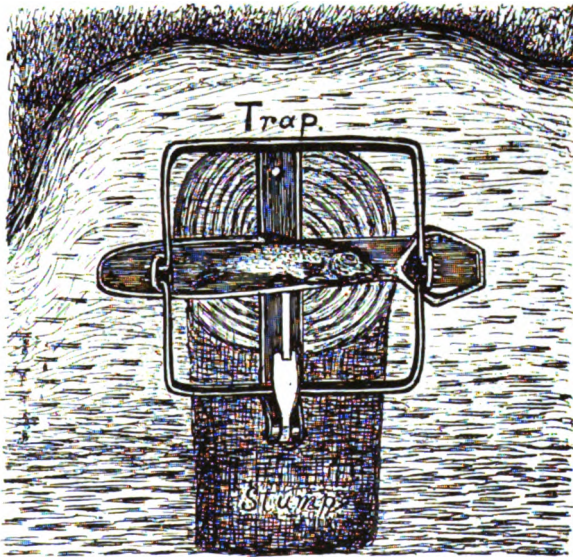


FIG. 117.—LANE'S KINGFISHER TRAP.

Small nets of a few yards long made of fine black silk, with a small mesh, are used in some parts of the country for taking kingfishers. These nets are placed across a small water-course, particularly where bushes or trees on the banks so overhang as to form a natural arch, or the arch of a bridge, Fig. 118, in such a manner that, a little "slack" being allowed, the bird is taken to a certainty in attempting to pass. In some districts a considerable income is made by persons skilful in setting glade nets not only for taking kingfishers, but other birds.

HERON. Though heronries are few as compared with former times, some still exist here and there throughout the country, and such good fishers are the birds that river conservators have to take repressive measures and offer reward for herons killed, as by the Exe Conservators in the estuary of the Exe, where much damage



FIG. 118.—NETTING BIRDS AT A BRIDGE.

is done by these birds, and a heron killed in 1907 was found to have forty-two young trout in its crop.

The heron and other fish-eating birds are taken by the heron trap, Fig. 119, which is set under water, affixed on a stump in the water, and, baited with a fish,—a catch is ensured.

CURLEWS, both “whaups” and “whimbrels,” are usually shot, their flesh being good eating. Only hurtful to fish.

WATER-HENS exert benign influence on watercourses, by lakes and their environs by consuming numerous pests, but their peregrinations and depredations in watercress beds are intolerable, therefore recourse is had to the gun, trap, and snare. As the birds swim or run through constantly frequented tracks which they use in dense undergrowth or rushes, hair nooses attached to string and stretched across such places are certain to effect captures.

COOTS are particularly useful in destroying various pests that

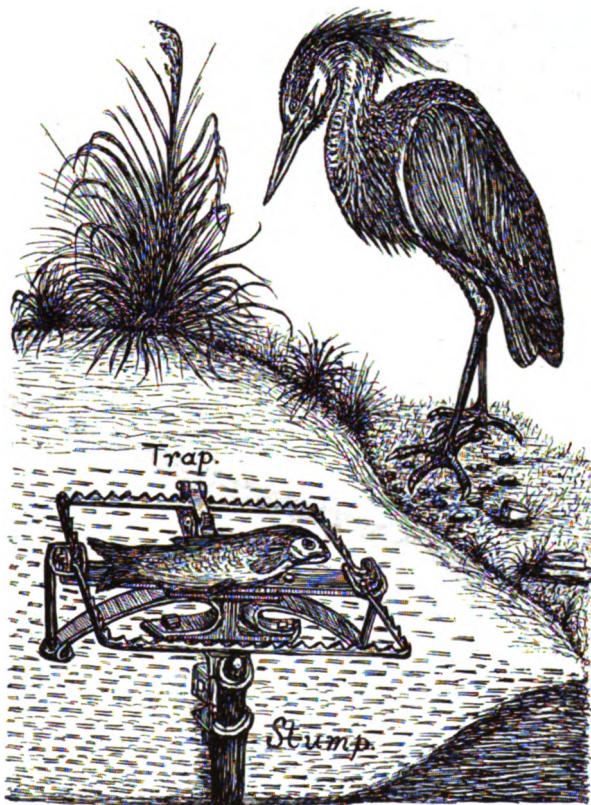


FIG. 119.—THE HERON AND HERON TRAP.

prey upon vegetation, especially in breeding time ; but their eggs, also those of water-hens, are so much sought after that neither increase to a prejudicial extent ; and they are also so decimated in winter by shooting, when they assemble on the banks of rivers, lakes and in marshes, though they can hardly be considered good eating, that riverside and marshland graziers are deprived of their services.

LITTLE GREBE or DABCHICK. This bird, and also the Crested Grebe, is so limited in number as to do little harm to fisheries, though neither of these birds would be tolerated in fish hatcheries or rearing ponds containing small fish, but would be trapped.

COMMON GULL. This and most gulls feed principally upon fish, and in undue numbers damage the fisheries industry to a serious extent ; and as their attentions to the land are mainly concentrated

on the coasts, the farmers inland derive little benefit from the gull's destruction of pests. On the coasts and in estuaries gulls devour vast quantities of garbage that would otherwise be a nuisance, so that upon the whole gulls may be classed as compensating in usefulness for damage inflicted on fisheries. A fair balance is usually maintained by relaxing the Wild Birds' Protection Acts by County Councils so that their eggs may be taken in districts where they have so increased as to cause serious damage to fishermen.

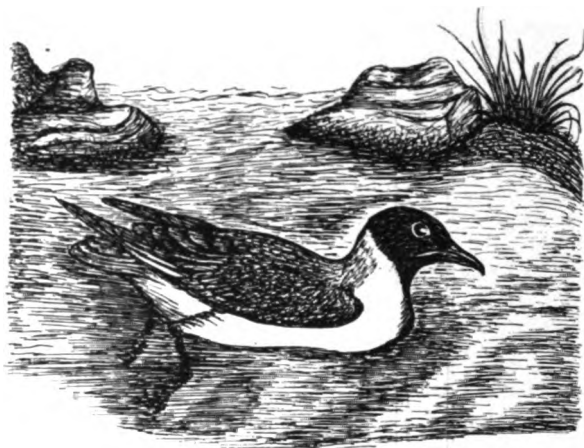


FIG. 120.—THE BLACK-HEADED GULL.

Gulls are readily trapped by tying a piece of offal or fish to the plate or fork of a trap with large jaws, such as the Heron Trap (Fig. 119), with 12-in. jaws for the large gulls, and not less than 7-in. jaws for the small gulls. The traps are set in shallow water and secured on a stump in the water; baited with a fish, such trap will take any fish-eating bird. Fish-hooks are often baited with offal, or pieces of fish, and pegged down, for the purpose of catching gulls.

The BLACK-HEADED GULL (*Larus ridibundus*, Fig. 120) sometimes breeds on the ponds and lakes of the eastern coasts, but are mostly driven away, as at their breeding-places they are prevented multiplying, the eggs being in much request, having a good flavour and no unpleasant fishy taste, for the birds at this time of year live on land-slugs and worms chiefly. When the eggs are removed, like many other species, they lay again, and even a third time, but the eggs are smaller, some not above a third the proper size. Some eggs of this species are as abnormal in shape and size as eggs of the common fowl frequently are. Unless unduly multiplied the black-headed gull is not injurious to cultivated crops.

CHAPTER VIII

MIGRATORY BIRDS

INSECTIVOROUS AND HARMLESS

NIGHTJAR or GOATSUCKER. Feeding entirely upon insects—night-flying moths, beetles, gnats, etc.—this bird is strictly protected. Sometimes, however, it is captured in glade-nets, stretched in narrow glades or ridings in woods from tree to tree, ostensibly for catching hawks, but harmless night-flying birds often fall victims in glade-nets to the “setters’” rapacity.

SWIFT. This bird has lofty ideas in nesting and flight, and scours the open spaces in towns and their environs in quest of insects incessantly from dawn to dusk, freeing the air of countless pests.

SWALLOWS. These live solely upon insects, taking flies of all kinds and many species of gnats, small moths and beetles on the wing, and beetles and other insects upon the ground. The swarms of winged aphides that migrate from ligneous to herbaceous plants, and from one plant to another in early summer in woods to late September, afford a fine harvest for swallows, and the crane flies that fly over the marshes, fields, pastures and lawns towards the end of the summer, are eagerly seized by the swallows flying low. Harming no one, swallows should be strictly protected internationally, their slaughter in the South of Europe and everywhere interdicted, even as food, and above all for purposes of fashion. Probably every swallow worn as millinery represents a decrease of useful vegetation equal to the weight of the person wearing it, in consequence of damage inflicted by pests as result of its destruction, and it equally applies to the food furnished to the killer by the swallow, this being out of all proportion to the food that would be available were it allowed to live and render incalculable service to humanity. Birds, eggs and free-breeding should be a national and international concern as regards protection, no interference with these being tolerated in any part of the world, not even by a sparrow, much less by a person for ladies’ headgear.

GRASSHOPPER WARBLER and SEDGE WARBLER. These birds render untold service to foresters, osier-growers and farmers by river and stream-sides. Anglers, however, complain of small bird protection resulting in a relative scarcity of mayflies, etc., so that both the fish and sport are embarrassed.

NIGHTINGALE. Delightful in song and harmless in habits, this bird is a general favourite and welcomed by every one, except the farmer, when its presence draws crowds of listeners to trample down his meadow grass and other crops. For capturing nightingales a trap, called the nightingale trap, a compromise between the bow-net and the spring trap, is used, also for taking most insectivorous birds, and may be bought at most bird-shops.

CHIFF-CHAFF and WILLOW WARBLER. In devouring the pests of forest-trees, particularly leaf-rolling caterpillars, the chiff-chaff is pre-eminent; and for clearing woods, thickets, pleasure grounds and gardens of insect pests the willow warbler has no rival.

COMMON WHITETHROAT or NETTLE-CREEPER. Feeding upon aphides, caterpillars and other forest, field and garden pests, much benefit is conferred on the nation. Similar remarks apply to the Lesser Whitethroat or Brake Warbler. In *Fruit Crops and Bird Protection* Mr. Cecil H. Hooper says, of the nettle creeper, that "in July and August they bring their broods into gardens and orchards, and make havoc among the currants and raspberries: they also eat green peas and peck green gooseberries." This excerpt is given as showing the acquiring of new tastes by insectivorous birds under certain circumstances, for in ordinary garden practice these proclivities on the part of the whitethroats are certainly exceptional, and, for practical purposes, it is safe to say that the benefit derived from their presence more than counterbalances any loss of garden produce.

WHEAT-EAR and WHIN-CHAT. These birds are in such esteem for the table, and so confined to solitary places, that they are not likely to increase to a degree as to change habits, which are favourable to vegetation. Wheat-ears are caught by suspending a hair noose between two turves placed on end, and touching each other in the form of a roof of a house. To this shelter the birds constantly run on the approach of danger, or even, apparently through timidity, on the gathering of storm-clouds.

REDSTART. Ants and their "eggs," flies, moths, spiders, caterpillars, worms and beetles enter largely into the fare of this bird, and as it never touches fruit and builds its nest in orchards and about houses, no one has a bad word for it.

GREY WAGTAIL. Nothing but good can be said about this, and also the Yellow Wagtail and White Wagtail, as they feed almost entirely upon insects, and are true friends of sheep-farmers in destroying the water snails that act as hosts to the liver-fluke.

TITLARK. There is no bird with a better character for working on behalf of the forester, farmer and gardener, as it exercises its good influence in wooded districts, clearing innumerable caterpillars in feeding its young and the surface pests away from streams that wagtails may not trouble about.

FLYCATCHER. Mute and familiar, this bird works with a will

on insects that have taken to flight by the time of its arrival in Britain, seizing sawflies, large moths, such as the yellow underwing, white butterflies, flies, beetles, aphides and other pests on wing. It visits and nests in town parks and gardens, and destroys pests that plague men and animals, or injure wild and cultivated crops. Flycatchers are said to eat cherries and raspberries, but this, as in some other cases of insectivorous birds, is for the living creatures found upon the fruit.

RED-BACKED SHRIKE. Although young birds, some say of game, may enter into the *menu* of the shrikes, essential service in destroying cockchafers, grasshoppers, dragon-flies and other insects is rendered to arboriculture, agriculture, horticulture and pisciculture. The prey of these birds is mostly taken on wing, after the manner of the flycatchers.

SISKIN. What the warblers, frequenting osier-beds and wooded margins of streams, effect in destroying insects, has its reflex in the siskins' feeding largely upon weed-seeds in those localities, though some aver that the birds are a means of scattering seed over the land, ignoring the fact of seeds digested being lifeless.

REDPOLE. Feeding upon small seeds, such as wild sorrel, knapweed, plantain and other obnoxious weeds, this bird is useful, and would be more so if bird-catchers were not allowed to capture them on waste places where weeds flourish and "winged" seeds perfect.

WRYNECK. The ants, "farming" aphides, have no greater enemy, and the pests infesting tree stems and limbs no more assiduous "rooters" out than the wrynecks.

CUCKOO. For devouring hairy caterpillars, even "woolly bear," and particularly gooseberry caterpillars, combined with all the hairy gentry that feast and fatten on foliage in woods, coppices, hedgerows, fields, fruit plantations and gardens, this bird is unequalled. It also eats flies, beetles, grasshoppers, surface larvæ, such as leather-jackets and wireworms, millipedes and molluscs, but its chief food is caterpillars. The young are mostly reared by the foster-parents on smooth caterpillars until they are able to obtain their own food.

SANDPIPER. This bird is to riversides in summer what the woodcock represents in winter, viz. the destruction of countless worms, molluscs and insects, which are not beneficial to land crops, whatever may be claimed for them in behoof of fish.

WOODCOCK. Though confining its attention to woods and thickets by watercourses, swamps, etc., much good is effected by the consumption of worms and molluscs, with larvæ of insects, inasmuch as pests consumed there prevents "crawlers" and "fliers" on land correspondingly. But the woodcock feeds largely upon ground some distance from wood and thicket watercourses, even hill downs being visited where formerly underwood or furze

was cut about a foot in height to a great extent along the ground in the shape of the letter v, at the apex of which an opening would be left where a hair noose would be set, which seldom failed to yield the pot-hunter a nightly supply, as the cock would run along



FIG. 121.—THE WOODCOCK.

the side of the brushwood, feeding until it was led into the snare. Woodcocks, however, are now so scarce that "pot-hunting" in the manner described is seldom practised. Nevertheless, in Ireland, on Lord Ardilaun's estate at Ashford, in Lough Corrib, more than two hundred woodcocks have been shot in a day.

SNIPE. Nesting to some extent in Britain, this bird may seem displaced in this connexion, yet snipe mostly migrate for breeding, and it is in winter time that their influence for good is exerted by destroying in or by small streams and ditches innumerable worms, molluscs, crustacea and insects. Snipe are sometimes

captured by fen-men and others at night by dragging a draw-net over the swamps and "gripped" fields, the booty including not a few larks and plovers.

RUFF. This bird is useful by feeding upon worms, molluscs, crustacea and insects in fen districts. In former times advantage was taken of the devotion of the males to the females by decoying them into nets or snares when "hilling," by previously setting nooses or nets in their battleground, into which they danced when fighting.

PARTLY USEFUL AND PARTLY INJURIOUS

HOBBY. Feeding chiefly on small birds, particularly the skylark and other denizens of the field, living on herbage and on seeds and grain, including mice, voles and beetles, this bird must be regarded as more useful than injurious to the general welfare of the nation, though it certainly preys on small game, both winged and ground, and even pounces upon chickens. It is, however, rare, and while game-rearing lasts is likely to be, in spite of County Council regulations in respect of egg and bird-taking preclusions, inasmuch as should-be informers are really the "breakers," well knowing that their dastardly work has no surveillance, and no hawk or owl suspected of interfering with game preservation and poultry rearing is countenanced, and therefore arboriculture, agriculture, and horticulture suffer in the degree of the decimation.

SHORT-EARED OWL. To agriculturists this bird is of great service in keeping down field and grass voles, mice and young rats, beetles and other insects. Its services, however, are mostly confined to tracts that are relatively left to take care of themselves, such as heaths, moors, bracken-places, furzy downs, hill pastures, and marshy meadows in the north of England and in Scotland, though not infrequently found in tracts of highly cultivated land, from John o' Groats to Land's End, there, of course, being some intermingling of wild with cultured stretches of country. This means the broad distinction between *Nature* and *Culture*. In the former the creation takes its course with little interference by man, but certain creatures increase to the advantage of the sportsman, and this by keeping down vermin-carnivorous beasts and birds of prey. These live upon herbivorous or vegetation-feeding animals and birds, which increase proportionately with the decrease of the carnivora or balancing forces of nature, and there follows a plethora of deer, hares and rabbits, grouse, partridge and other winged game, with a vast increase of vegetable-feeding, fruit and grain devouring birds. This is really success for the sportsmen, and in measure profit to the nation, by the destruction of vermin. But even this cannot be pursued without in-

curring famine, for the ruminants and rodents so increase as to eat and foul themselves out of existence. This, of course, does not occur in Britain, simply because the numbers are regulated and the ground changed to ensure health and due proportion of subjects to area. This is culture-game preservation and up-keep, with no advantage to general agriculturists, though winged game destroys many insect and other pests that feed upon vegetation. The rodents not classed as game tell against ground game as directly and against winged game as indirectly, as in the crops of the forester, farmer and gardener, a like remark applying to vegetarian birds, with a distinction—the game-preserved has no crop damageable by them, and fosters their increase by the restrictions in respect of game preservation, and more especially by the decimation of weasels, hawks (particularly the kestrel) and owl (particularly the barn and short-eared).

But there is another side to this question, viz., what restrictive measures does the forester, farmer and gardener take to protect their crops from the ravages of wild vegetable-feeding animals and birds, which in their several forms are as much vermin in respect of forest, field and garden crops, as are carnivorous animals and preying birds to game culture? The most that can be expected of game preservers is discrimination in the destruction of what is known to them as vermin. But it must be remembered that exclusive reliance cannot be placed on natural checks, and it is useless to decry the vigorous preservation of game as accountable for plagues of mice and voles, for history refutes such dictum, inasmuch as long before game preservation had interfered with the natural enemies of the rodents, Great Britain was subject to periodical swarms of mice and voles. The only precaution possible is watchfulness, and combined action on the part of foresters, farmers and gardeners, so that as soon as the first symptoms of undue increase of vermin is detected, prompt steps be taken to avert the recurrence of grievous damage. This, the destruction of *vermin*, is imperative for the success of all cultures, no vigilance being relaxed, no trust placed on empyrics, but adopt—

The good old plan,
That he should take who has the power,
And he should keep who can.

BLACKCAP WARBLER. "A family of blackcaps in a cherry orchard commit great havoc," says Mr. F. Smith. "They do not eat a quarter of the fruit they pick: they are also very fond of raspberries and figs." In the garden the blackcaps take a heavy toll of late sweet cherries, raspberries and currants for services rendered in consuming aphides and small caterpillars, and are difficult to exclude by netting. This, to be effective, must not be larger in mesh than that known as pilchard, and there must

not be any holes in it or apertures by which the birds can gain access to the fruit, for the blackcaps are very prying, and the worst pilferers of fruit of our summer visitors.

GARDEN WARBLER. For great service in respect of destroying small leaf-rolling caterpillars on fruit bushes or trees and ligneous plants generally, also for eating caterpillars of the white cabbage butterfly, this bird takes a little ripe fruit, such as late cherries, currants and raspberries. Its attacks, never very pronounced, may be warded off by small mesh netting.

FIELDFARE. A winter visitor, and feeding upon worms, larvæ, insects, seeds and wild fruits, such as berries of mountain-ash, hawthorn (haws), holly, briar (hips), etc., no complaint is lodged against the fieldfare by any person other than the admirer of autumn and winter berried plants, which are shorn of their beauty during severe weather by many other members of the thrush family as well as fieldfares. But the birds afford sport and adjunct to the table, therefore are sought after by some sportsmen and esteemed by some gastronomists. The gun is mostly used for bringing down fieldfares in Britain, but on the Continent the whole thrush family is taken in snares. There are two methods of hanging the hair nooses, but in both the snarer uses twigs about 18 in. in length. In one the twig is bent in the form of the figure 6, the tail end running through a slit cut in the upper part of the twig. The other method is to sharpen a twig at both ends and insert the points into a stem of underwood, thus forming a bow, of which the stem forms the string below the noose: and hanging from the lower part of the bow is placed a small branch, with a few berries of mountain-ash or other tree taken by the birds as food: this is fixed to the bow by inserting the stalk into a slit in the wood. The noose is attached to the twig, and so arranged as to hang neatly in the middle of the bow, and the lower part about three fingers' breadth from the bottom. The bird alighting on the lower side of the bow, and bending its neck to reach the berries, places its head in the noose, and then the fowler finds the victim hanging by the neck. The whole thrush family, which includes the blackbird, song and missel thrush, may be captured by the methods or modifications of them, foreshewn: and as they are, including redwings, nearly, if not quite, as good food as fieldfares, some compensation for damage inflicted on fruit crops may be had for the disagreeable task of killing them.

REDWING. This bird comes under the same category as the fieldfare in proclivities, and is usually associated with it in visits to this country.

TURTLEDOVE. Probably no visitor to Britain is more appreciated in coverts, parks and pleasure grounds than this; the cooing and evolution of the birds appealing to both ear and eye in the most agreeable way. But turtledoves may be protected so closely as,

like wood-pigeons by game-preservation, to become injurious to agricultural crops, for it must be remembered that they are vegetarians, and obtained at the expense of the farmer.



FIG. 122.—THE TURTLEDOVE.

CORNCRAKE. Worms, slugs and insects devoured by this bird, and the brood more than compensate for any damage done to grass or to corn: therefore protection should be accorded to it, though this will always be limited, as the landrail is good eating, and in Ireland *game*.

DESTRUCTIVE

CROSSBILL. The only means of repression is the gun when this bird appears in orchards, and by taking the nests or eggs in the forest.

SEA-SWALLOW. What the swallows and martins are to the land, this bird, as regards flight, is to the sea—very delightful to observe by visitors—but its destructive habits on fish demand repression by taking the eggs so as to reduce the number to consistence with the welfare of the fisheries.

CHAPTER IX

REPTILES

HARMLESS

COMMON LIZARD. Inhabiting dry rocky places, knowing no cultivation, this creature shuns man's presence, and works in his behoof by destroying insects and their larvæ, also woodlice and other pests; yet seldom is opportunity lost of compassing its destruction.

SAND LIZARD. Sandy heaths, more frequented by men than formerly, are now less freed of insects than when this "creeping thing" was less disturbed and had greater security for its life.

BLIND-WORM. At the very sight of this snake-like creature some persons shriek, and not a few rustics shrink, so long do superstitious ideas endure; therefore, there is time for flight or courage to summon into destruction. Thus the blind-worm, useful in destroying worms, slugs and insects, ceases more and more to exist.

GRASS SNAKE. Dread of snakes so possesses mankind that all, even the harmless, are ruthlessly destroyed whenever found, and this despite of service rendered in devouring voles and mice, slugs, woodlice, insects and their larvæ.

FROG. In better repute, no one wilfully kills the frog, as it is not under *saint* and *bard ban*, like the serpent and toad; therefore it lives to benefit all mankind by destroying worms, slugs, woodlice, millipedes, insects and their larvæ, including leather-jackets and wireworms, also gnats engendered in marshy places.

TOAD. Ugly, ungainly and unprepossessing, the toad makes amends by feeding upon slugs, woodlice, flies, earwigs and other insects, including their larvæ, such as caterpillars: for everything lacking in appearance, it is one of the most valuable creatures to the forester, farmer and gardener.

NEWT. The newts are to water and damp spots what the toad is to land in drier places, feeding upon small worms, slugs, woodlice and insects.

THE ADDER**DANGEROUS**

ADDER. Probably no other creature is so feared in Britain as the viper, and on account of its retaliatory habits when cornered or trodden upon receives no quarter from man. Although useful in destroying grass voles and other vegetarian pests, its dangerous nature to man and beast cause it to be inconsistent with cultivation and civilized life.

CHAPTER X

GAME

LARGE GAME

RED-DEER. In the Highlands of Scotland large areas of land, called deer-forests, are devoted to this ruminant, the main object in view being pastime, known as deer-stalking, for the wealthy, who may be the proprietors, or, as more generally is the case, rich commercial magnates, alien millionaires and princely personages. Thus the landlord's chief interest is income—rent for game-shooting privilege and profit from timber production. These pursuits are probably the best that can be followed on much of the vast tracts of land in the Highlands from the owners' point of view—that is, more rent can be obtained for the land as deer-forest in conjunction with timber produce than were it devoted to arboricultural, agricultural, and horticultural crops in accordance with its adaptation in respect of soil and environment. But it is very questionable if such reservation of land for sporting purposes conduces to the welfare of the nation in as full measure as were the land afforested, farmed and gardened. Forest, farm and garden produce needed by the inhabitants of the British Islands is largely imported, and it is a matter of vital interest whether timber, cereals and forage crops could not be grown in place of scrub and pasture (of a sort), supporting only a few semi-wild animals, not contributing anything approaching in utility to the nation as cultivated land crops, giving more home produce, less reliance on importations, much more employment, increased wealth, and, better than all, multiplied sturdy Anglo-Saxons.

Red-deer are great strayers, invading meadows and arable fields, also orchards, at night-time, and inflict great damage on crops: and as these belong to tenant-farmers, alleviation from such incursions is imperative, in order that they may reap the advantage of their efforts in full productive capacity of the soil in place of having to suffer a diminution of each year's harvest

through the game preserve. The damage inflicted by red-deer on forest and other crops having been already referred to, it is only necessary in this place to treat of preventatives for restricting their ravages.

Red-deer, and all deer, must be kept within the forest, park, or other portion of land set apart for their conservation. Formerly this was, and still is, effected by walls and oak palings, in the case of old establishments : perhaps quite as much to insure



FIG. 123.—BOULTON & PAUL'S CONTINUOUS FENCING FOR DEER.

privacy as to restrict the deer. But in recent years wire has supplanted stone and brick walls, oak and other timber barricades, for even where these still exist deer are confined to less extensive areas, giving place to cattle and sheep, and as many (at one time exclusive to the public) enclosures are open at certain times through the condescension of the owners, every well-conducted person is given opportunity of beholding deer without climbing park-walls and opaque fencing, and encountering man-traps and spring-guns, inasmuch as the deer are kept in a compound by iron fencing. This, Fig. 123, unclimbable wrought-iron hurdle or continuous bar-fencing, 6 ft high, 8 bars, proves effective against all large game. Strained wire fencing of 6 ft. height also answers for retaining or excluding deer, and barbed wire makes a fence if not less than $4\frac{1}{2}$ ft. high, that not only protects farms, nurseries and gardens against deer, but practically precludes deer- and fox-hunting, and even pedestrian prowlers.

FALLOW-DEER. More dainty and restless than red-deer, fallow-deer do more damage in woods and nurseries by nibbling young growth and trampling it under foot. In deer-parks, where young trees may from time to time be introduced, it is necessary to protect them, whether in clumps or as single specimens, by wrought-iron fencing, or guards, 6 ft. in height, and at that distance from the stems so as to safeguard the leading growths from injury, and this protection be continued until the trees are so advanced in height and strength as not to be in danger of damage by the deer. Deciduous trees, with clear stems of 8 ft. from the ground to the branches, will be sufficiently protected by ordinary flat or round bar wrought-iron tree-guards, "barbed" being most effective, though in some respects objectionable—that of possible damage to the deer coming into contact with the "barbs."

ROE-DEER. In the wilks of northern Scotland the roebucks do considerable damage by nibbling and browsing on buds and young shoots of forest-trees, practically precluding seedlings from making their progressive growth and maintaining their leaders intact, so that would-be timber in due course is mere scrub, and small saplings being used as fraying-stocks, there is much hampering of the forester in his efforts to cultivate timber trees.



FIG. 124.—PAPER-PROTECTED CONIFER.

Roe-deer must be excluded from farms, nurseries and gardens by fencing not less than $4\frac{1}{2}$ ft. in height, for once they have fed freely on cultivated crops, either through a gap in the fence or by leaping over it, they are very apt to return and feed on the better fare outside the forest. Scarecrows are of little use, for roe-deer, like most wild creatures, soon learn to distinguish

between the scarecrow and the "lord of the creation," ever alert to his own interest.

But roe-deer dread nothing so much as the unnatural, and have such fear of being "taken-in," that a bit of newspaper, about 4 in. square tied round the buds at the top of the leading shoot of a conifer, Fig. 124, acts as a very simple and efficient protection. This, to be effective, must be done in autumn, and will usually remain attached like a collar at the base of the new growth till the following autumn, when the procedure must be repeated, and each autumn succeeding until the plants have outgrown danger of damage.

Another method of warding off attacks of deer consists in coating the top shoots of young trees with an offensive pigment, such as a mixture of four parts fresh cow-dung, one part coal-tar or slaked lime, and just enough urine to admit of working the whole into a paste, which may be laid on with a wooden spud. Or the proprietary article called Smearoleum No. 1 (Thomas & Co., Ltd., Ceres Works, Liverpool), which is handy and effective, may be used safely on both the leading shoots and also stems liable to be barked. This, of course, has to be repeated every autumn, and if commenced early enough and continued long enough, there is no danger of the plants losing their leading growths or of the stems being barked by deer.

STAG-HUNTING. To the keeping of deer in enclosures no objection is taken by the general public other than that in the case of deer-forests occupying thousands, and deer-parks hundreds, of acres, some,¹ if not all, of the land could be put to other purposes of greater service to the nation. But not a few persons declaim against stag-hunting on the ground of its cruelty, insisting that the hinds and dis-antlered stags used in the chase are practically domestic creatures, defenceless, and strangers to the district on which they are turned: therefore, flee through fear of hounds, are overtaken quickly, mangled, soon exhausted, or perchance the hunt staff be "up," given another chance, not of escape but of being chased, and often resulting in the deer seeking refuge in sheds, yards, and houses. Thus captured, "doctored," and carted off, the animal may be good for another day, for hunting several times each season, and for affording sport during ten years in some cases. Albeit, not many people at the meet see the run, and fewer the finish of the chase, therefore are unacquainted with the cruelties that come in in the course of the hunt: and these, the eye-witnesses protest, are not of a nature to cause a feeling of horror in other than fireside humanitarians.

¹ According to the Report of the Deer Forest Commission, 1892, nearly 3,000,000 acres of land suitable for small holdings are available.

GROUND GAME

Hares and rabbits comprise ground game, and, as already shown, militate against arboricultural, agricultural and horticultural pursuits. The damage inflicted on forest-trees in their early stages of growth accounts in great measure for the indifferent supply and inferior quality of British deal and pine wood as compared with imported; and even hard-wood is so cross-grained for a considerable length of bole as to be unfit for structural purposes. The difference between British and imported timber is readily accounted for, inasmuch as in Britain wild animals, such as deer and hare, have been protected by forest and game laws from the time of the Norman Conquest: whereas in the wilds of Northern Europe and America no such restrictions existed, but any one, as in Saxon times in Great Britain, could help himself to a meal by the exercise of his skill as distinct from that of the chase: consequently, ruminant and rodent mammals good for food were kept from depredation in cultivated tracts, and even in their native wilds limited in number through the concomitant and counter-balancing forces of Nature, as well as by decimation increasing correspondingly with the bringing of forest and wild into cultivation by multiplied and advancing mankind. This implies alike forest and chase depletion: hence we get at the *root* of the Forest Laws of William the Conqueror, and also the Game Laws of the Barons—the preservation of game for sport, the production of timber and of food being secondary considerations. These, however, always forced themselves to the front as antagonistic to the national aspirations for land to cultivate, and security for the crops from inroads of large and ground game. The large game—because the country would not stand its undue keeping at the expense of soil-cultivators and of hindrance to crop production—were restricted to forests and deer-parks, though deer at large were not allowed to be killed, but, like stray cattle, restored intact to the owners with or without impounding or recompense for damage. This, however, came to naught, for now large game, except the King's deer, may be destroyed when roaming at large. Ground game, equally with large game, may now be kept from eating the crops of owner and tenant cultivators, inasmuch as the Game Laws in force admit property in hares and rabbits to be vested in the occupiers of the land: but under existing laws the woodlands and warrens, which serve as the breeding places of hares and rabbits, may not be invaded by tenants or other cultivators not also owning or tenancing the coverts: therefore the ground game is free to sally forth at feeding-times and commit havoc according to number on cultivated crops coming within reach. The ravages of this nature are distinctly encouraged, for no steps are taken to confine the game to the

coverts, the protection of crops being left entirely to the cultivator, who, if to be as successful as the game-preserved, must destroy vermin, in which category hares and rabbits from an arboricultural, agricultural and horticultural standpoint, must be classed, with a distinction—that of their flesh being good food and their skins useful.

This antagonism of cultivators to many game-preservers is unquestionably due to over-preservation, ground and even winged game being so preserved and unrestricted as to hinder cultural effort, and inflict such loss as to confer all the profit on the game-preservation, or outweigh any advantage in respect of less rent exaction in consideration of game protection, the 2s. 6d. to 5s. per acre allowance being inadequate. On the other hand, tenants, particularly farmers, all imbued with sporting instincts, and landlords, especially resident owners, sportsmen "every inch," admit a reciprocity of interests, and maintain a good understanding. But when the landlord relegates the sporting rights over his estate to a tenant uninterested in sport other than head of game, discountenancing coursing, beagling and fox-hunting, the aspect of affairs change, as then there is no consideration for crops, and no requiting of injuries by taking of produce—hay, corn and straw. Thus the dual tenantry speedily leads to conflict—the farmer exercises his right to ground game and even to winged game, while the sporting tenant grumbles and deafens the owner with complaints, and the result is disaster to all concerned, both tenants, as the landlord's interest is solely pecuniary, clearing out, the sporting tenant through there not being any game adequate to the rental, and the farming-tenant through dilapidation of farmstead and general neglect of estate. Sooner or later the landlord finds himself possessed of land for which no tenant can be found, and the nation suffers loss in forest, farm, and garden crops.

As the habits of ground game—hares and rabbits—have already been referred to at considerable length under their respective heading, we now proceed to treat of preventive and repressive measures.

WARDING OFF ATTACKS BY FEEDING. In woods, plantations and ornamental coverts much damage to trees and shrubs during hard frost and drifted snow may be avoided by placing freshly cut branches of ash, crab, poplar, thorn-acacia, etc., on the ground or snow, and in the case of a young plantation leading away from the burrows in opposite direction, thinly close by the warren and leading up to the main point in closer order, forming a sort of branches-plantation at the desired rendezvous. A few swedes strewed from time to time through the improvised covert, along with a little hay and such dainties as bran, crushed oats and cake, render assurance doubly sure, not forgetting to replenish the tree

loppings now and again, utilising saplings unlikely to become profitable.

WIRE-NETTING. Hares and rabbits are connoisseurs in respect of newly introduced trees and shrubs, and will roam under the most favouring conditions of food supply, being epicurean in taste, rarely failing to test newly planted, even of existing species or varieties, in quality of shoot and bark: therefore it is necessary to protect the stems of standard trees, and the whole plant in the case of bushes. The netting for this purpose should be 3 ft. high or wide, 1 in. mesh for stems, and $1\frac{1}{2}$ in. mesh for bushes. The girdle for standard trees must be large enough to allow for several years' growth, and the enclosure for bushes be so far from the growths as to admit of at least one season's development, enlarging the enclosure from time to time until the circle reaches 6 ft. in diameter, when the tree or bush requiring more room, the netting may be dispensed with, as the stem will then, unless of particular acceptance, be hare and rabbit proof, or may be protected by a "smear," while the leading growths are beyond reach; and though the lateral branches may be nibbled, the tree, even a conifer, will not be materially disfigured as a specimen.

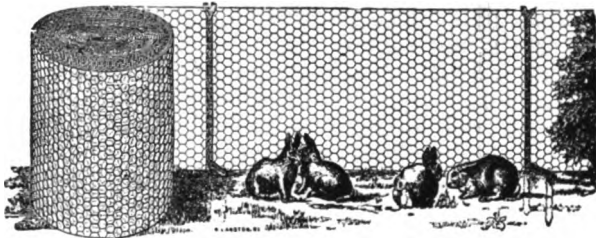


FIG. 125.—BOULTON & PAUL'S GALVANIZED WIRE-NETTING.

For masses or clumps, galvanized wire-netting 3 ft. wide, $1\frac{1}{2}$ in. mesh, fixed with wooden stakes, and with the lower edge resting on the ground, proves effective as a temporary protection for young trees against hares and rabbits. A neater fence, Fig. 125, is made with wrought-iron stakes. Hares seldom bound over 3 ft. high netting for feeding purposes, but often do so for "kindling," we having known enclosed clumps thus selected, evidently for safety of the leverets. Rabbits also do not climb over such fences if it be given a leaning outwards, or even burrow under the wire in cases of isolated specimen or clumps here and there in ornamental coverts: hence the netting serves for the needful protection until the shrubs and trees are out of danger. In snow-time, however, when the netting from drifted snow may unduly expose the trees to attack, stems and growths above snow-line, and within reach of hares and rabbits, must be dressed with an

obnoxious substance. With these precautions, trees and shrubs may be got up on the residential portions of estates where ground game exists in considerable number, continuing the fencing for a period of from seven to ten years after planting. Even at the expiration of the time named it may be necessary to protect the stems of shrubs with wire-netting, as rabbits trim off branches as high as they can reach, and in other cases applying a protective substance.

For farms, fields, nurseries, fruit plantations, market and private gardens, pleasure grounds, belts, clumps and plantations, good fencing with wire-netting must be adopted if hares and rabbits are to be excluded, and it is a moot question whether the proprietors of coverts should bound them by ground game proof wire-netting, or foresters, farmers and gardeners be under the necessity of protecting their crops against hares and rabbits. The former implies the hare-park and rabbit-warren, and the degradation of coursing, beagling, and shooting to the level of tame deer-hunting and rabbit-coursing, against which humanitarians are dead-set : and the latter relief from the depredations of ground game without expense on their part in keeping it at bay or even down. As bearing on these points, we may mention that in cutting eleven acres of wheat at Lenton, Lincolnshire, over 100 rabbits, three foxes, and several pheasants were disturbed : and that in Devon farmers found rabbits so numerous and committing so much damage—two acres of corn having been eaten right away at Cullompton—as to have recourse to killing and hawking them about the villages at the low price of 3*d.* each. In the Lincolnshire case, it is clear that ground game and pheasants may live where there are foxes, and thus both shooting and fox-hunting may be indulged in : while in the Devon instance, in which no mention is made of foxes, rabbits have increased to the extent of there not being any corn to cut, and it is recorded that in the same year the Dartmoor foxhounds, hunting near Shipley, attacked a pony and killed it before they could be driven off.

Coverts enclosed by ground game proof wire-netting preclude all idea of sport, therefore the incubus of protection for crops rests, if sporting is to continue, with the cultivators, and this protection in a sporting district must not be of such nature as to unduly interfere with fox-hunting. Barbed top-wire fencing enclosing farms and fields practically preclude fox-hunting, and may be justifiable in the case of nurseries, fruit plantations, market and private gardens. Where such fencing exists or may be erected, and ground game is to be excluded, wire-netting is easily affixed, the only important points to attend to being the width, mesh and insertion in the ground. The netting, 3 ft. wide, 1½ in. mesh, should be placed in the ground 6 in. at an angle of 45° on the side from whence rabbits are to be prevented from

beginning deep burrows. Where there is no fencing, iron or wood end posts may be used for fixing the netting, a top wire being stretched from post to post, and to this the upper edge of the netting secured.

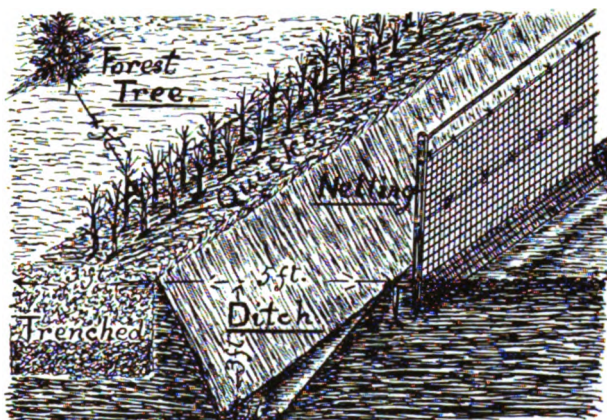


FIG. 126.—FIXING WIRE-NETTING.

For temporary purposes, iron stakes with prongs on one side may be used for fixing the netting, the prongs 6 in. long, and the part above 3 ft. this being "eyed" at 15, 30 and 35 in. respectively from the prongs upwards, No. 10 wire being stretched through all the eyes, and the wires being tight, the netting being secured to the two lowest wires and let into the ground, as shown, Fig. 126: it does not "bag," and rabbits seldom burrow under it. The top wire practically adds 5 in. to the height, as hares "see" it and shy, neither they nor rabbits passing over, especially if, on the approach of severe weather, the upper edge of the netting and top wire be coated with an obnoxious substance.

NOXIOUS SUBSTANCES. In the case of young plantations, where it would be inadvisable to exclude hares and rabbits on account of food in the shape of gorse, broom, mountain-ash and other scrub, with coarse grasses and sometimes heather being available, the trees in danger of losing their leading growths or having the stems barked may be protected by either home-made or purchased smears. The former usually consist of fresh cow-dung, coal-tar or slaked lime, brought to oil-paint consistency with urine, as advised under deer; or 1 peck fresh cowdung, $\frac{1}{2}$ peck quicklime, $\frac{1}{2}$ lb. flowers of sulphur and $\frac{1}{4}$ lb. lampblack, mixing the whole into a thick paint with urine and soapsuds; or equal proportions of sulphur, soot and lime, made into a thick

cream with cow-manure; or lime-water and cow-manure made strong. These may be used on any part of the plant, but the following is for stem use: 1 peck of quicklime, slaked with soft water (old soapsuds are best): when hot add $\frac{1}{2}$ gallon crude carbolic acid, $\frac{1}{2}$ gallon gas-tar and 4 lb. of sulphur. Stir well, and about the time of frost wash the stems as high as one can reach. This is to prevent girdling by any kind of animal. Taylor's lime and sulphur mixture (p. 190) brushed on the parts within reach of hares and rabbits also prevent their barking the trees.

Simpler, and less objectionable in appearance, are the proprietary preparations named "Tree Protective Composition" (Messrs. Dickson, Ltd., Chester), "Smearoleum" (Thomas & Co., Ltd., Ceres Works, Liverpool), which may be used on stems and leading growths without injury to the trees at any stage of their development. The articles named are easily applied to stems with a brush, and to newly planted small conifers by india-rubber gloves smeared in the "palms" with the preparation, and placing the feet, or at least one foot, by the side of each plant collar, then, with the gloved hands draw upwards to the apex, the needles of conifers or the young shoots of low plants are so coated as to prevent attack by ground game. Trees with clear stems must have these smeared from the ground to a height of a yard or more, remembering that newly planted subjects are more liable to attack than established, and that the period of attack extends from October to March inclusive, though most pronounced during severe and prolonged frost and snow.

DESTROYING HARES. Although hares are usually reserved for shooting, occasionally recourse is had to trapping, snaring or capturing alive. The hare constructs a "form." This is sometimes a seat under a bush, sometimes a kind of bower, and sometimes a hole just large enough to conceal its owner under a shelving ledge of ground. These forms generally have a run leading out from them to a distance of a dozen or more yards, and it is on this run at the entrance of the form that trapping is feasible.¹

The large-sized rabbit-traps, $4\frac{1}{2}$ or 5 in. jaws, Fig. 127, answer for trapping hares, and about three traps are required for each form. If the hare be in the seat, approach carefully as near as considered safe and set the trap, and instead of in the middle of the patch, put on the side of the patch furthest from the hare's seat. If the hare be not in the form, set the trap at the entrance or open side of the seat, and the earth and grass used to cover it must exactly resemble the surrounding part. About 5 yards from the form set a second trap, and on the side of the patch nearest the seat, and in the case of a long run place a trap 5 yards from the second. In the case of a gap or "smoot" in a

¹ First mentioned in *Practical Trapping*, by W. Carnegie.

hedge, place a trap on each side, and at the points where the beats are taken up and down. The traps should be visited late in the evening and a couple of hours after sunrise, the captured hare "crying" so as to call attention of men or animals, and tempt these to take unfair possession of it.

Hares are easily snared, the snares, called "hare," being strongly made, and costing 3s. 6d. per dozen complete. They are best secured by iron trap stakes instead of wooden ones, as they can

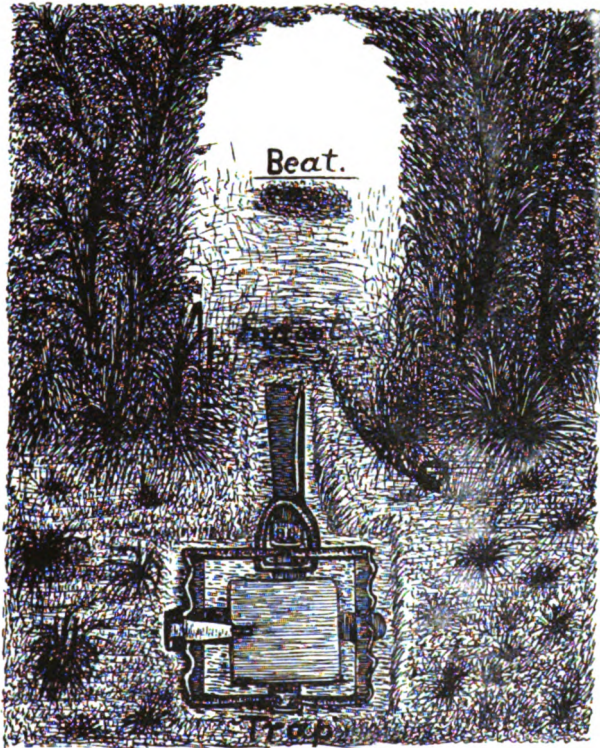


FIG. 127.—LANE'S IMPROVED DORSET RABBIT-TRAP SET FOR HARE.

be driven out of sight, though some gin-setters prefer pieces of sapling ash, well sharpened, instead of the ordinary split wooden peg, or even iron peg, driven so as to show no "white" to alarm the hare. The best places for setting snares for hares are gaps in hedges and gateways noticed to be much used, also tracks in clover fields, etc., especially where clover has been freshly cut, though the better place is the run leading to the form, or at its

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entrance. Several snares may be placed along the run, midway between the patches, and about half a dozen yards from one to another. The noose should be about 4 in. in diameter, the height from the ground being measured by placing the hand sideways in the run and extending only the thumb upwards; the lower side of the noose should then rest on the top of it.

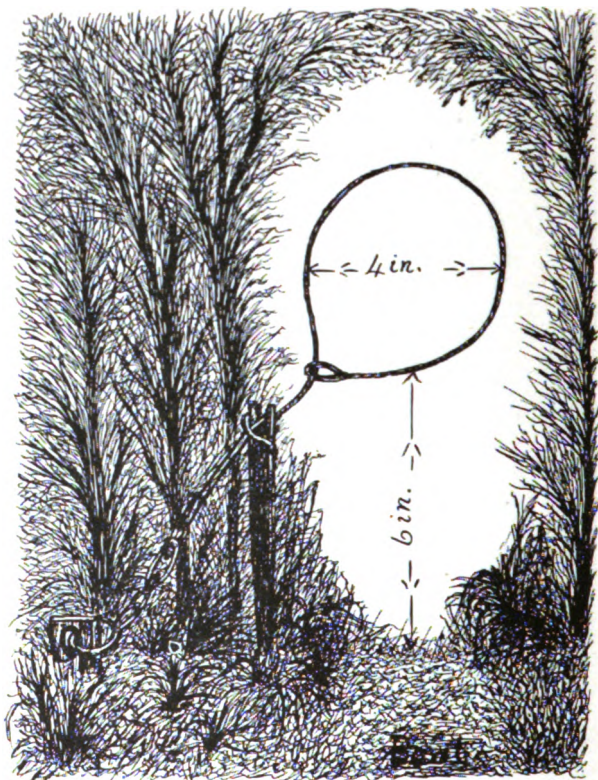


FIG. 128.—SNARE SET FOR HARE.

Netting hares is a very old way¹ of taking them alive, and is carried on by dogs, trained for the purpose of driving, and are as adept at hares as are sheep-dogs at sheep-penning, and are usually known as lurchers. Two persons, both, as well as a dog, well up to the "game," are needed. Hares are known to be feeding, or having fed well, "squatted" in a clover or other field; then,

¹ Practised by "never work" unlegalized sportsmen on moor-edge farms and other out-of-the-way districts.

on a fine summer night the trio, at dark, commence operations. The gate is opened and fastened back, a large net is extended across the gateway, with the lower edge lying on the ground about 6 in. on the field side. The men, one on each end of the net, but on opposite sides and ends, start the dog to work, as it does zigzag, round the field, and probably returns to the starting-point blank, when it turns, still keeping round the field on new ground, covering it all by in-and-out trotting about as wide as in the first journey, until at length a hare is found. The dog then puts up the hare, making no attempt to catch it, for all its efforts are directed towards driving it into the net by preventing its escape by gaps in the hedge. Finally, the hare makes a rush for the gate and is caught in the net, and before giving cry is seized and bagged by the "liers" in wait.

DESTROYING RABBITS. As well known, rabbits live in small colonies, each of which consists of one or more families. These colonies are broken up in winter, preparatory to the breeding season, and are afterwards re-formed by the does that were in the colony before the winter, each family remaining near its birth-place, and thus the colony is reinstated in its old quarters; but if fresh members, and thus becoming over-populated, they migrate, and then only in part, to some more suitable spot.

In the spring time rabbits lie almost exclusively in coverts, hedges, and banks, always feeding close to them, the females only leaving them for a time, when they make "nests" separate from the burrows, either in open fields or in coverts, and as soon as the young are old enough they are removed to hedges or other sheltering places. In summer rabbits spend much of their time in the open air making "seats," but always near their burrows, and delight in coverts and open copses and brakes. In autumn their days are spent in hedges, plantations, stubbles, furzy and grassy places, as well as woods with tussocks and undergrowth relatively open. In winter rabbits occupy the warmest burrows existing or that may be made, usually in a bank and at the roots of trees, when they generally live in pairs or threes, commonly a buck and one or two does, or else all does, or a single buck.

Spring is the real breeding time of rabbits, and unless then doing serious damage to growing crops, they are not destroyed, as this would mean a great sacrifice of human food. But when the rabbits have their abodes round a field of corn, or other crop liable to be eaten right away, there is nothing for it but to either exclude them by netting or kill them. This is best done by trapping, but very often this is difficult to carry out, as the hedge and bank may belong to the covert, the neighbouring landowner or tenant. The rabbit taking up its abode in a hedge commences to burrow, scratching out the earth close to the ground, and on this heap is the place to set a trap. If rabbits are in the hedge there will be a track up

the small bank of earth, and the droppings about, chiefly inside the hole, indicate by their freshness present occupation, and the most used of such tracks is that on which to set. There will also be a run leading to the hole, and along this a number of patches more trodden on, the rest at intervals of about 9 in. correspond-

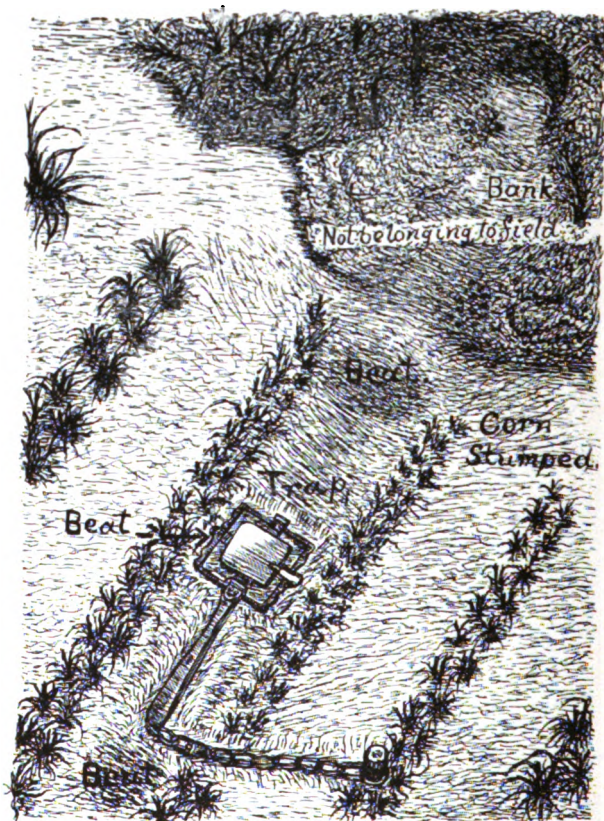


FIG. 129.—LANE'S REGISTERED DORSET RABBIT TRAP SET IN CORN FOR RABBIT.

ing with the beats or jumps of the rabbit, and it is on these patches the traps are to be set, because the animal puts its feet there.

Having chosen the spot most likely to effect a catch, place the trap with the plate end at right angles to the run; extend the chain and drive in the stake, straight, and the top below the surface, with about 1 in. play. Then with the "Gamekeeper's Friend" (Bur-

gess & Co., Malvern Wells), or hammer, dig out the place for the trap, making it the proper form and size and deep enough so as to admit of covering the spring about $\frac{1}{2}$ -in. Set the trap, try it in the dish and fitting properly, neither too shallow nor too deep, as the jaws and plate must only just be covered up, and flattening the soil in the square for the jaws, the trap being removed for the purpose, replace it, and taking a small piece of wood or twig, hold it over the jaw and under the plate, touching each on the opposite side to the flap in order to prevent the trap springing while being set. Commence covering up by the spring and chain, then cover the plate and jaws with earth by means of the riddle or sieve just hiding all; and smoothing and making as like the surrounding parts as possible, withdraw the stick, fill up the little hole, and the trap is set. In case of the runs leading up over the grass, the covering should be done by picking short, not long, grass, and sprinkling it over till the trap is covered, pressing gently down. The spring and chain can be covered by raising a flap of turf, hollowing out the soil to admit them and gently turning the flap of turf back again. The traps should be seen to soon after nine in the morning and again about five in the afternoon during the spring, gradually getting earlier in the morning and later in the evening as the season advances. If the weather be rainy the traps will require frequent re-setting or re-covering, but in the ordinary way the traps will not need to be moved or re-set until the third or fourth day.

As the summer advances and the first batch of young are able to take care of themselves, the old rabbits begin to lie out more, and by June all will be seeking suitable places for their seats, but with a distinct run from the burrows. In these grass runs the patches are much more distinct than on bare ground, and the traps must be set in these or at playholes at right angles to the run. Sometimes rabbits make numerous horse-shoe shaped places as if having commenced to burrow and "rued"; trapping at such spots should be in the middle of the place and at right angles to the run leading up to it. These sham-seats or burrows are not uncommon in stubble fields, and the runs leading into small expanses of brake are good places wherein to set traps.

The real trapping season commences in September and October, according to locality, and continues for three or four months, and may be practised in runs, hedges and burrows, the latter being the general procedure, and almost invariably by what is known as *under-ground* trapping, i.e., the trap is placed so far in the mouth of the burrow as to be out-of-the-way of pheasant-feet or creatures other than the rabbits. The traps are seen to early in the morning and late in the afternoon, though in some cases the traps are set in the afternoon and seen to in the morning: the traps being re-set either at that time or in the afternoon as most convenient.

The trapping of rabbits has always been a "bone of contention."

to humanitarians on the score of its cruelty, and to render the capture more in accordance with their views, various modifications of ordinary rabbit traps have been made. "Burgess's Improved Humane Trap" (Wm. Burgess & Co., Malvern Wells), Fig. 130, has india-rubber-covered jaws, in which the rubber is ribbed, and in that way

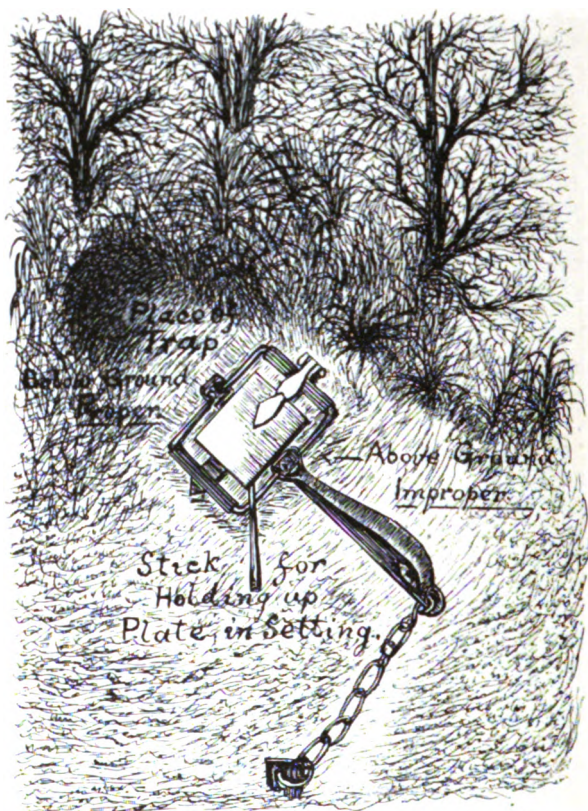


FIG. 130.—BURGESS'S IMPROVED HUMANE TRAP.

holds the leg firmly without breaking it. Traps with deep-roughened iron jaws are also made for the purpose.

SNARING RABBITS is only practicable in the open, and is generally practised where traps may not be used. The snares are of two kinds. *Ordinary*, for strangling the rabbit, and *knotted*, for catching rabbits alive; cost of the former complete is 2s. 6d. per dozen, and the latter 3s. In choosing places to set them, the most open part, midway between the ends of the run, must be taken, and the

snare must be set either *before* or *after* a beat (flat place made by the jumps of the animals). The stake or peg is driven in, then the noose, 3 in. in diameter, formed and placed in position, and a hand breadth at the knuckles from the ground. The best runs to set on are those most distinct coming from a plantation, from a burrow, hole through a hedge, and any well-worked one. The

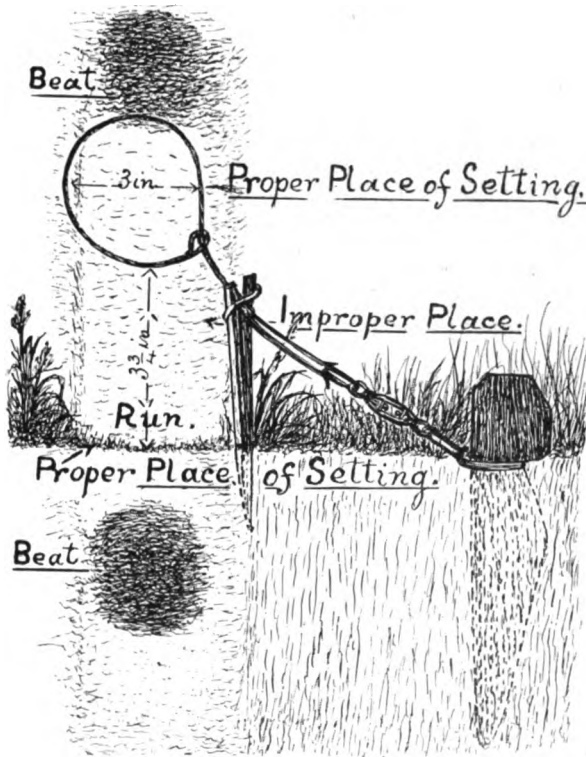


FIG. 131.—RABBIT SNARE.

snares must be visited night and morning, and not left set by day where there are pheasants or poultry.

NETTING RABBITS is of two kinds, one by bolting and the other by driving. The *bolting* requires a dog with a nose to indicate the hole nearest the rabbit, two or three good working ferrets, and nets for placing over the holes. The nets, called "purse," complete with pegs and rings, cost 6s. to 7s. 6d. per dozen. The work is very simple. The dog marks a rabbit. Nets are placed over the *bolt* holes, the ferret put in (having been duly stringed). The rabbit

or rabbits bolt into the net or nets, but the ferret pins one or more rabbits and has to be dug out, the digger being guided by the string. That is not sport—of course not, our purpose is to capture the rabbits. If sport be the object, the ferret is muzzled, the dog is duplicated, and the ferreter with accomplices carry guns, nets being dispensed with, or only partly used.

Better for sporting purposes in respect of rabbits is the bolting system by means of *fuses*, usually made of thick brown paper or cardboard cut into strips $1\frac{1}{2}$ ft. long and 2 in. wide, the strips being soaked in a solution of saltpetre and cayenne pepper, dried, lighted and placed in the hole rolled up. Rabbit fumes for bolting rabbits (Wm. Burgess & Co., Malvern Wells) cost 4s. per gross. The fuses are also used to make the rabbits lie out. At Weald Hall, Brentford, after the use of these fuses, 6 guns shot 1,027 rabbits in one day, and the next day 405 more.

Netting rabbits by *driving* is a wholesale means of capture, and is practised in coppice and wood-side where rabbits come out at night to feed. The nets are made in lengths of 50, 100, and 150 yards, and to hang from $2\frac{1}{2}$ to 5 ft. the colour being grey, green or tanned, 3 ft. netting being usually employed, and the stakes to hold it up cost 6s. per dozen. The rabbits are allowed to breed and fatten until late summer or autumn; then the netting is affixed after dark alongside the wood-side or place of day harbouring, and rabbits outlying are driven into the net. In the morning nothing is seen but a beaten track and a goodly amount of down. In one instance along a plantation-side, where at one time 200 rabbits were counted in the dusk of the evening at the close of September, not one was to be seen after the first week of October.

Ground game are also kept down by sportsmen, dogs, foxes, stoats, weasels, and birds of prey, but these hardly accord with the requirements of cultivators where game-preserving is not carried to an extreme, and on account of the depredations committed, growers of crops have been obliged to seek powers from the legislature enabling them to take repressive measures.

By the Ground Game Act of 1880 every occupier has a right to kill, take and sell ground game, but not the right to shoot between the expiration of first hour after sunset and the commencement of the last hour before sunrise; spring traps, except in rabbit holes, and poison of any kind are prohibited. The Hares Preservation Act, 1892, however, enacts that during the months of March, April, May, June, and July it is unlawful to sell, or expose for sale, hares or leverets. The close time (March to July inclusive) simply aims at preventing the extinction of the hare by restricting the cruel, wanton, and wasteful decimation during the breeding season of a very desirable food-animal. Nevertheless, hares and rabbits may be killed during close time, but not exposed for sale.

Hares are coursed by greyhounds, but this has greatly fallen

off, not so much by scarcity of hares, due to the passing of the *Ground Game Act* of 1880, as to the close preservation of game that preceded the Act and rendered its passing imperative in the interests of tenant-occupiers, the sight of a greyhound so frightening the game-preserved that coursing meetings, at one time so popular almost all over the country, were suppressed one after another in rapid succession, not many remaining in 1880. Thus a very ancient sport passed into relative oblivion, and is only kept from complete obliteration by the national annual meeting at Aintree and the aspirations evoked by the Waterloo Cup. Nevertheless, the British greyhound (*Canis Græius*) accords with the quaint description given in a work printed in 1496, by Wynkyn de Worde (the *Book of St. Albans*), as to what a greyhound should be—

Headed lyke a snake,
Neckyed lyke a drake,
Fottyed lyke a catte,
Taylled lyke a ratte.
Syded lyke a breme,
And chyned lyke a beme.

Hares are still hunted by harriers or beagles. This, popularly called *beagling*, is generally regarded as a prelude to foxhunting, inasmuch as when a person has been entered to beagles and has learnt to study hound work, only his or her purse debars riding to foxhounds. Every follower of the little hounds is, therefore, a foxhunter *in posse* and if at times the line of a fox tempts them astray, they will, especially towards the end of season, compensate by driving out-lying foxes back to their coverts and teaching them to stay there.

BEAGLING, like foxhunting, is antagonistic to the over-preservation of ground game, and being in accord with national instinct in respect of sport being accessible to all chase aspirants, commends itself to a large number of persons with moderate means, and in districts where there is practically nothing to take the community out of the humdrum of ordinary occupation, hare-hunting has enervating and good fellowship influence on the national life. Even meets of harriers, foxhounds, and (it must be conceded) stag-hounds, have much to commend them in these respects, and in the chase of wild animals there is nothing but what appeals to man's nature as humane.

RABBIT-COURSING is quite another thing from beagling and fox-hunting. The rabbits are turned down on ground to which they are strangers, and are simply driven through fear of shouting men and howling dogs to make a run (of a sort) for life without so much as a chance of escape. Sport of this nature only appeals to pot-hunters—degraded and vicious sportsmen.

WINGED GAME

Under the head of "game," strictly so called, are included, throughout the United Kingdom, grouse, black game, pheasants, partridges, and hares ; for the practically extinct bustard may be left out of consideration for ordinary purposes, and the ptarmigan is only to be found in Scotland. In Ireland quails and landrails are included among "game," but, although not so designated in the Acts relating to Great Britain, these birds cannot be legally shot without a game licence ; and a similar remark may be made with regard to woodcock and snipe. Other wild-fowl, not game, are protected by the Wild Birds Protection Act, the close season extending from March 1 to August 1 ; but this is liable to modification by County Councils, even relaxed in respect of certain birds particularly injurious to fisheries, such as terns on the East Suffolk coast, and Devonshire Exe Fishery District in respect of cormorants or shags, owing to their destructiveness to the salmon fisheries ; and as the list of protected birds varies, it is necessary for cultivators to provide themselves with that relating to the respective district.

PHEASANT. The pheasant, as its name proclaims, is the bird of Phasis, the Caucasian river that falls into the Black Sea not far from the modern Batoum. But if the Argonauts brought it thence, as legends set forth, they certainly did not bring it so far as England. The bird, however, was at least naturalized in this country very long ago, if it was not a native. King John in 1190 granted to William Briwere a licence to "hunt the hare, fox, cat, and wolf in Devonshire, with a 'free warren' throughout all his own lands for hares, pheasants and partridges," which implies that pheasants then ran wild. Before that, the Abbot of Amesbury is said to have been licensed by Henry I to kill hares and pheasants, and King Harold's regulations prescribe a pheasant as an alternative to two partridges in the rations of the canons of Waltham Abbey.

When pheasant-rearing for purposes of sport was instituted we have no distinct or definite data ; though an introduced ¹ bird it probably obtained from very remote times. Be that as it may, it was not until the middle of the nineteenth century that pheasant-rearing came much into vogue, though for a long time before a good stock of pheasants were kept in the coverts by regular feeding by placing small stacks of unthrashed corn in different parts of the wood, raising them about a foot from the ground, and so affording amusement for the birds as well as food. This is supplemented by hand-feeding with maize, wheat, barley, buckwheat, dari and oats. Maize is generally preferred to the smaller grain, for one reason

¹ This is very questionable as regards the old English or dark-necked (*Phasianus colchicus*).

above all that sparrows, yellow-hammers and other grain-eating birds are unable to eat it. Of course, the locations for feeding are where spruce and other straight, horizontally branched conifers of size suitable for roosting are near. Oaks and beech trees too afford acorns and mast, and are desirable trees to have in a covert; also as undergrowth the bramble, hazel, dogrose, and hawthorn, where, not too much overtopped, they afford natural food for the birds. Thus the pheasant—*feeds* encourage grain-eating birds, and also the frugiverous, the former making sad havoc in cornfields, and the latter in fruit plantations; and as small woods are preferred to large, the coverts are largely distributed over a district.

But the pheasants are not allowed to breed naturally, pheasant eggs being too great a temptation, and the birds have so great attraction for foxes that they are taken up for the breeding season. This is done about the beginning of February, as some time is required for them to get over their wildness. Five hens and one cock bird are placed in a pen, and a change of cock from a distance effected if possible. Then there are eggs, say 150 from each pen, and from six pens 900, and so on up to several thousands. Broody hens, not pheasant, but domestic fowls, such as Silver Wyandotte, are employed for incubation and foster-mothers, and from the hatching quarters the hens and young birds are taken to the rearing ground, each hen placed in a coop with a run in front to which the birds are confined for three or four days and then allowed to run on grass. When the birds get too large to enter the coops, these are drawn by degrees towards the coverts, and as the birds are able to fly, some tall branches are placed upright in the ground around the coops as an inducement to roosting. When at their destination they are left on a bare spot, and not finding shelter, fly into the trees to roost. The mistake is not made to turn the half-grown pheasants into the coverts and expect them to shift for themselves, but the birds are fed on soft food until they have their second feathers, and then what do they eat?—the farmer's ripening corn, his peas and beans, his leguminous herbage, his root-crop tops, and even the roots! Of course, this depends upon circumstances, but under any conditions pheasants are given to straying, and find out crops they like at considerable distance from the covert where they are regularly fed.

Under the Land Tenure Bill, 1906, tenant farmers may claim compensation for damage by game; but what does this represent in respect of high cultivation and loss of produce to the nation? Truly, the steady increase in the number of game licence-holders is gratifying to lovers of the gun. During 1881 there were 57,983 game and shooting licences issued in the United Kingdom. In 1891 the number had increased to 60,010, an addition during the decade of 2,027. During 1896 there were no fewer than 62,750 licences to shoot game issued, showing an increase of 2,700 upon the return of 1891. This also means corresponding increase of

game, and that signifies less crop production, and consequently less food for the masses.

Tenant-farmers are practically powerless to deal with pheasants to their advantage, for the killing season does not begin till October 1, and then the pheasants have been withdrawn from the fields and overgrown hedges into the coverts. Recouping themselves for damage in that respect is out of the question, and as for compensation in regard to amount of good done by the insects consumed, that is relegated to the rearing field.

Pheasants are easily caught in traps, such as the ordinary wicker (Wm. Burgess & Co., Malvern Wells), and the wire cage (Boulton & Paul, Norwich); these are generally used for taking up pheasants for breeding purposes, but, of course, they answer at any time. Makeshift "take-ups" are formed of wire-netting with pockets or mouths easy of entrance, but difficult of egress, and tanned netting on top. The wood-pigeon cage may also be used for capturing pheasants. Poachers have recourse to various wiles to capture pheasants, one of which, on the authority of a gamekeeper, is given as the most telling, namely, strewing *sultana raisins* about and leading away from the feeds; and when this has been effected to a safe place, a number of small fish-hooks are secured by short lines to underwood stems or pegs and each hook baited with a sultana raisin. The pheasants swallow the raisins and hooks with a result that may be better imagined than described.

PARTRIDGES. Under any and all circumstances partridges are far less destructive to farm-crops than pheasants, and unless over-preserved, when injury to root and other crops may result from the numerous "dusting" places and also feeding on produce they otherwise would not, probably compensate for their keep by devouring obnoxious pests. The most damage is done when the cultivation is high and the game-preserver, intent on as large a bag as possible, regardless of where the nests may be, little diffident about bushing, and not careful in ranging potato and turnip fields. The two never agree. The tenant is wholly bent on crop production, and the owner acts as if desirous of sharing in the profits by preserving and even rearing as much game as possible. This, however, occurs but rarely in the case of partridges under normal circumstances, for though large bags may be made in some districts—as on the famous partridge grounds at Chippenham Park, where a day's shooting in October, commencing shortly after ten and closing at five o'clock, the King being one of the shooters, resulted in a bag of 669 partridges, 38 pheasants, and 82 hares—the difficulty is more in the opposite direction, for which letting the shooting is in the main responsible.

But in not a few instances the natural stock of partridges on an estate is improved by turning down some imported Hungarian birds in order to mate with the native birds, and thus strengthen

the stock. The Hungarian birds are usually delivered early in January, turned down in pairs, a few couples at a time, not far from a double hedge or covert, and are fed with grain for a short time until they make themselves at home.

Partridges are also hand-reared similarly to pheasants, except that it is desirable to obtain small and light hens for sitting, tame and used to handling bantams making good mothers. The young partridges are carefully fed, at first on yolk of hard-boiled eggs and about an equal quantity of partridge meal, mixed up like bread-crumbs, after a time some biscuits may be added, and afterwards a little prepared meat chopped fine. The little birds are sparingly supplied with "ants' eggs," and when old enough led up to grain-feeding with good canary seed, and in due time the birds take to the fields.

QUAILS. Probably these, like partridges, compensate for any damage done to crops by the pests they devour. Besides, shooters and poachers give them so little quarter that they are never likely to become notably injurious to cultivated crops. Fond of lucerne and other leguminous herbage, they are sometimes taken by hair nooses set in their tracks in lucerne fields, either secured to pegs or lumps of well-worked clay.

CAPERCAILZIE. So rare is this bird that it is never likely to become injurious in the forest, though from its weight and habit of feeding on the tender growth of trees it would probably prove destructive if reared and maintained in such numbers as pheasants.

BLACK COCK. This bird certainly compensates, by devouring insects, for any damage inflicted on herbage in its native wilds.

GROUSE. Feeding upon the tender growths of heather and other moorland herbage and also destroying insects and other pests, grouse hardly interfere with the pasturage for sheep. But they love the leguminous herbage, and also the grain of the moor-edge farmers, who, however, do not consider the grouse's depredations particularly hurtful. It is matter, nevertheless, for consideration as to whether grouse would not have to disappear in case of the suitable parts of moorland being reclaimed for arboricultural, agricultural, and horticultural purposes.

WILD DUCK. In its wild state no objection can be taken to the mallard and nest of the duck family, inasmuch as throughout the year good service is rendered on both water and land by the destruction of pests, it being only in harvest-time that the ducks trouble the farmer, and then only on laid corn and stubbles. The only advantage the farmer derives from ducks is the destruction of such pests as slugs, for in most cases the resorts of the creatures that roam over his fields and crops and derive no small share of their subsistence therefrom are not his to do as he may desire. This is where the evil comes in in respect of all wild animals

fostered in places over which cultivators have no right of entry, and even on their land no practical control during the breeding season and the growth of crops through legislative restrictions. It is the same all through the chapter, even wild ducks that breed away from the "brood" or duck-pond return to their quarters augmented by August 1 and there may remain until the following March 1, when again the ducks, not having been bagged, make for places where they may breed in safety.

Wild duck is not game, but a gun licence is needed by a person shooting it. This applies to all persons carrying a gun or other firearm; and a game-licence is required by every person who hunts, shoots, or takes game, except persons (in Great Britain) taking woodcock or snipe with nets or springs, rabbit-warren proprietors, or others, on enclosed land, killing rabbits, persons hunting deer, or hares, with hounds, owners or occupiers, or their servants, killing deer on their own land, beaters and others not holding guns, attending holders of game-licences. Occupiers of enclosed land, or owners, having the right to kill game, may themselves kill hares, or authorize others to do so, without a licence; but such authority must be limited to one person at a time in any one parish, and must be registered with the Clerk of the Justices of the Petty Sessional Division in which the land is situate. Even when the quarry is not what is legally known as "game," a gun-licence is necessary. A game licence, however, covers a gun-licence, and soldiers, sailors, volunteers, or constables on duty, or at practice, or occupiers of land scaring birds or killing vermin on such land, or persons so acting under the orders of occupiers holding a licence, need not take out a gun-licence. Unless, however, the occupier is himself licensed he cannot authorize any unlicensed person to carry a gun. "Scaring" birds is not to be regarded as including killing of any birds, and vermin does not include rabbits.

Wild ducks are sometimes reared for stocking lakes and ponds, and being comparatively easy birds to rear, the stock occasionally becomes so great as to prove injurious to crops. The eggs are placed under a hen in the ordinary way, and they hatch in twenty-eight days, the nest, not eggs, being frequently moistened. When hatched, the young birds and hens are placed in a coop on a grass run, and fed regularly, with duck-meal scalded and given in a sloppy state. They are supplied with water in a small vessel, but in the spring and cold weather, not allowed on the pond or lake, as many would get cramp. In due course the weather and water gets warmer, and the ducks, grown and eager for a swim, are placed on the water. Of course they are led from soft to hard food, maize being usually strewn in the water for safety against grain-feeding birds, but within easy reach of the long-necked ducks. Unfortunately, feeding does not keep the ducks to the lake any more than "feeds" keep pheasants to coverts; but they roam over the fields

betimes, returning to their safety place, and there afford sport and profit.

Thus reared ducks, like reared partridges and pheasants, differ in nothing from domesticated members of their families but in being given liberty as adults to become wild and unassailable other than in season, and then only by duly licensed and authorized persons, with the advantage all on the side of the rearers on account of resort being always to the refuges.

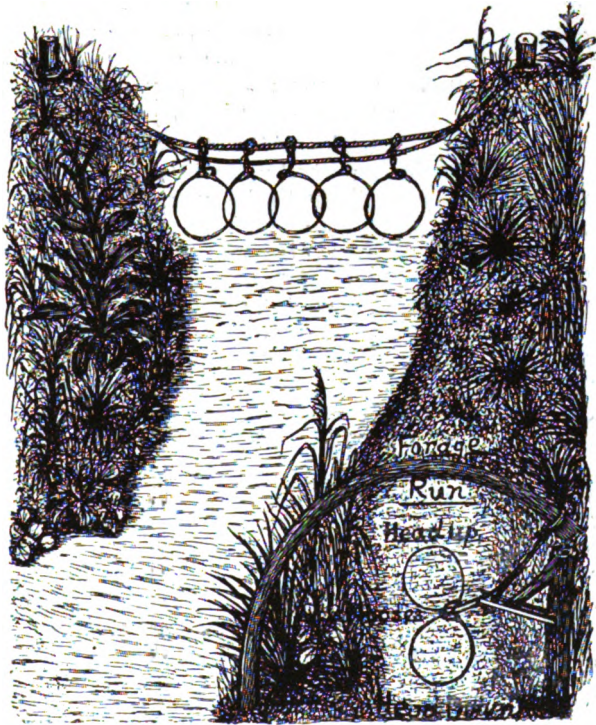


FIG. 132.—CAPTURING WILD DUCKS IN NOOSES.

Wild duck proper is very little seen in the close season—March 1 to August 1—after which it is eagerly sought after by the waterside sportsman both legitimate and otherwise. The latter scruples not to use glade-nets where narrow glades or ridings admit of their being stretched, and wild ducks are known to fly and perchance a woodcock. Horsehair nooses attached to a string are sometimes placed across a dyke or stream, and so close to the water that the ducks are compelled when swimming under the string to

stretch out their necks, when they are easily caught in the hanging nooses. The decoy net is a more open method of procedure, and still more sportsmanlike ; the use of decoy ducks both for mallard and teal enticement, and then relying on the gun and dog. Fish-hooks, baited with boiled maize and affixed to whipcord lines, are sometimes used by degraded sportsmen for capturing wild duck, regardless of the torture inflicted.

ROOKS AND SEED CORN. Mr. James Howard, of Clapham Park, Bedford, having improved the recipe for an effective, but non-poisonous, dressing for seed corn which he made public two or three years ago, thus describes his present practice in the *Times* :—

“ For 8 bushels of wheat, or 6 bushels of barley, take half a pint of gas tar, 2 lb. of blue vitriol, and 2 gallons of boiling water. The tar should be accurately measured (not guessed at), and should be of the consistency of treacle. After the tar is put into a pail, 1 gallon of water should be poured upon it, and well stirred ; the black greasy scum which will rise to the surface should be skimmed off with a wisp of straw or piece of sacking, to which it will readily adhere. While this operation is going on another man should be mixing the [blue] vitriol with the other gallon of water. When ready both lots should be mixed together and poured over the heap of corn previously shot upon the barn floor ; the heap should be well turned over two or three times quickly, so as to saturate the whole. If any tar or dregs remain at the bottom of the pail they should not be poured on the grain, or it will stick together in lumps, and be likely to clog the drill cups. I have used this dressing for several years with complete success ; not a single boy has been employed to mind the fields, nor has a gun been fired. The full plant, however, whether wheat or barley, has afforded evidence that no loss has accrued.” (*The Gardener's Chronicle*, Vol. XII, new series, p. 658.)

The foregoing *Dressing for Seed Corn* answers for other kinds of seed against seed-eating birds generally as well as rooks, and also as a preventive of “ smut ” in cereals.

Part III

DOMESTICATED ANIMALS

SINCE the dawn of history we find record of the utilization of certain animals, birds and reptiles, for the destruction of vermin; therefore we may briefly allude to those which have been found of most essential service in this country.

CHAPTER XI

ANIMALS

CAT (*Felis catus*). Herodotus, in his account of Egypt (lib. ii.), first mentions the cat as diminishing the vermin infesting human



FIG. 133.—THE WILD CAT.
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dwelling, and the celebrated naturalist Temminck, in his monograph of the genus *Felis*, adduces strong evidence of the cat being originally domesticated in Egypt; also that the gloved cat (*F. maniculata*) of Egypt and Nubia is, in all probability, the original stock of the domestic cat, though the race has been much modified by crossing. The wild cat of Europe, therefore, has been regarded as the domestic cat returned to the wild state rather than its original stock, and is occasionally found in large woods.

Cats, regardless of breed, may be divided into two classes:

1. Ornamental. 2. Useful.

ORNAMENTAL CATS are notable for youthful sportiveness and fondness of being handled, petted and nursed, gentle demureness of manner in after life, highly sensitive and fond of ease, and evincing little anxiety except for comfortable quarters and the continuance of enjoyment. Docile, tractable, and even good-tempered drawing-room, kitchen, and other well-taken-care-of-and-much-

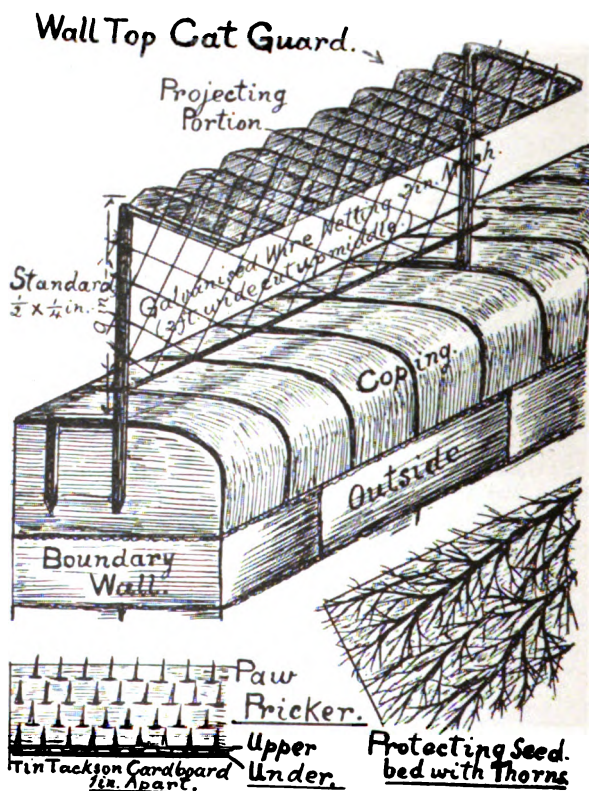


FIG. 134.—CAT GUARDS.

petted cats, mainly confine their desires to possessing an abundance of flesh or fish, their winsomeness and good manners representing the measure of their utility. Some urban and suburban cats, however, are excellent mousers and ratters, displaying considerable intelligent power, as well as great fondness for various aromatic substances, such as musk plants, valerian and catmint (*Nepeta*), and a bed of *Nemophila* will cause them to come in numbers, roll over it, and scratch up the plants until there is not a vestige left. So fond are town cats of such things that they throw themselves into an ecstasy of pleasure, and are utterly regardless of the confusion they make among seeds. Indeed, so great a nuisance are ladies' cats in some places that their neighbours have to protect their gardens by wire netting affixed to the top of boundary walls or fences (Fig. 134), and also the ground against scratching cats.



FIG. 135.—CAT IN AMBUSH AND HOUSE MICE.

USEFUL CATS. The common English breeds display great partiality for haylofts, barns, outbuildings and surroundings, and possess all the attributes of the race, namely, cunning disposition, nocturnal habits, much patience in pursuit and in lying in ambush for prey (Fig. 135), seizing it by a sudden leap, then playing with the captive before putting it to death, and not limiting destruction to the mere gratification of appetite.

The subtlety and circumspection of the common cat are seen in all its habits and movements, and humane, not pampered, treatment renders it invaluable to the householder, farmer and gardener.

The gamekeeper, on the other hand, regards a useful cat with the greatest aversion, and spares no effort to compass its destruction. The owner of the cat, especially of a female one, may be partly to blame, for kittens must be inducted by the mother into the art of procuring their own livelihood, the natural instinct always predominating in this respect; hence they are presented with live or freshly-killed food betimes from mice up to leverets, and from unfledged birds up to young partridges and pheasants, even the swift hare and bouncing rabbit finding place in the cat's menu. Rearing cats near game preserves, therefore, almost always results in the disappearance of the mother, and the progeny in their turn fall to the gun of the gamekeeper, or are allured by tempting bait into torturing traps. This may to some extent be prevented by drowning surplus kittens within twenty-four hours of their birth, then the parent will be less prone to poach, and may elude the gamekeeper for many years.

When domiciled in farm-buildings, stables, and sheds in gardens, the cat appears to great advantage; as having free ingress and egress, it keeps a watchful eye on intruding mice, and seldom permits meadow voles to exist in the neighbourhood. Poaching mainly occurs, as before stated, when the cat has kittens, which are brought forth from three to six at a litter and remain blind for nine days, the period of gestation being sixty-three days.

Cats are also great scarers of birds, and have been utilized for protecting fruit, of which an example (Fig. 136) will be suggestive:

"When at the Rev. H. L. Ewen's, the Rectory, Offord D'Arcy, Huntingdon, some time ago, I was struck with the novelty of both cats and kittens being employed as bird scarers, not by tethering, as is sometimes done, with string or chain to a particular place, but by a sort of continuous running line. In this particular instance the cats, adults as well as kittens—the one as far as I could see being as good as the other—were employed to protect strawberries from the thrushes and blackbirds. The strawberry-beds were 4 to 6 ft. wide, with an alley between. At each end of the alleys a peg was driven into the ground, and between these pegs galvanized wire, I think No. 10, was stretched about an inch from the ground, though it rested on the ground in some places. Before securing the wire to the pegs a piece of small chain about 12 in. long was secured to the wire by passing the wire through a ring at one end of the chain, and at the other end of chain was a swivel ring, such as is used for dog-chains, only both chains and rings were smaller. The cats were secured to the chains by small collars, and the cats could run the whole length of the strawberry beds without let or hindrance; and that they answered their purpose was evident by the fine fruit, principally President, being unmolested. It is necessary to state that at each end of the "run" a drain tile (about 9 in. diameter) was laid on its side in the line

of the run and slightly sloping to it, and the end farthest from the run in both cases was closed by a board, whilst those next the run were left open, thereby forming a good shelter for the cats in inclement weather. Saucers replete with milk and other evidence of food being supplied, rendered the arrangement complete" (*Journal of Horticulture*, July 26, 1883, p. 73).

Occasionally a cat, called *wild*, is found in woods, and evidently making its home there. But this, in most cases, is only the house cat taken to a depraved mode of life, and like the ordinary tame cat taken to poaching must be summarily dealt with, as nothing comes amiss to such cats in the way of game. The game-preserver



FIG. 136.—REV. H. L. EWEN'S METHOD OF SCARING BIRDS FROM STRAW-BERRIES.

contends that when a cat has taken to this mode of life it is useless in or about the house and its outbuildings, and not being easy to shoot, it must be trapped.

The trap employed may be that known as the *Patent Hugger*,

10-in. jaws, which, being furnished with sharp spikes, kills the animal at once, and tells "no tale." But the poaching (it may be a "tom" on courting excursion) cat is usually captured with the large rabbit trap, selecting a place for setting at side of a

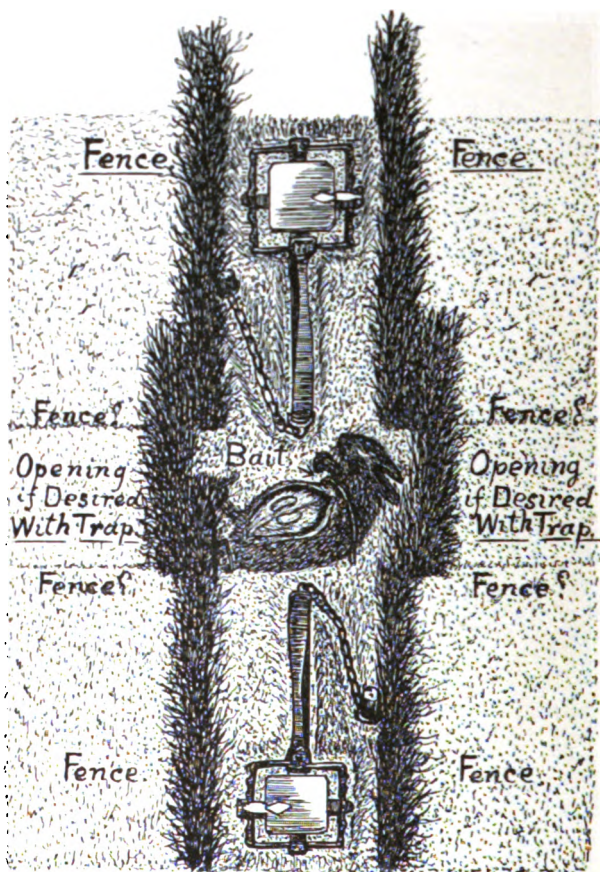


FIG. 137.—TRAP SET FOR CAT IN OPEN.

path or ride, and by a tree-butt or thick bush, forming a pathway of sticks leading to the bait, generally a paunched rabbit opened out, placed and secured at the far end, with the trap carefully concealed at the entrance and spring inwards about 6 in. from the bait. Where such "back" as that just mentioned is not at hand, as in rabbit-warrens and other open places, a sort of square may be made with brushwood, in which to peg the bait, leading

two narrow pathways from it at each end and exactly opposite each other, in each of which place a trap (Fig. 137), or dig a false rabbit hole in a bank 18 in. long, and bait with rabbit entrails pegged down firmly, and set the trap with the spring inwards about 6 in. from the bait. A few bushes may be placed at the entrance of the hole, pathway-like. The worst of trapping cats is that of their being liable to make escape minus a paw or large part of a leg. Such misfortune, however, does not damp the enthusiasm of cats for hunting, any more than it does a three-legged rabbit from leaving a covert and feeding on herbage in the adjoining field.

Dog (*Canis vulgaris*). The dog has been domesticated from the earliest times, numerous representations of the noble animal and companion of man appearing in the ancient monuments of Egypt and Assyria, even in various breeds, several of which can easily be identified with those of present times. At a period coeval with or anterior to the Exodus out of Egypt the dog was there regarded as the friend and servant of man, employed in the care of flocks, and as the guardian of the house.



FIG. 138.—ENGLISH TERRIER AND RAT.

Dogs are divided into three great classes or groups. Class I, Greyhounds, sub-divided into two families—the Rough, embracing the Irish wolfdog, Highland deerhound, and the Russian, etc., greyhounds; and the Smooth, including the common greyhound, Italian, etc. Class II. This includes four families: Hounds—bloodhound, staghound, foxhound, harrier, beagle, otterhound, etc., with Shooting Dogs—English, French, Italian, Portuguese, Spanish and Russian pointers. Terriers—English (Fig. 138), Scottish, Skye, Irish, etc. Newfoundland includes the dog of that name, Labrador (major and minor), Pyrenean wolfdog, Esquimaux

dog, etc. ; Shepherd Dogs—of England, France, “ collie ” of Scotland, drovers, and cur-dog. Spaniels—setter or land spaniel, water spaniel, springer, etc. Class III. Two families come under this, namely—Mastiff—British, Mount St. Bernard, Spanish, Thibet, bulldog, pug dog, etc. Mongrels—lurcher, bull terrier, etc.

Of the sagacity, fidelity, affection, courage and other qualities of the dog, with the several uses, mostly indicated by their names, we have no occasion to speak ; but we may say that a majority of their numbers are kept for no essential purpose, and in such a mongrelity of breed as to baffle a Darwinian in respect of origin and variation under domestication. In many, if not most, instances of dog-keeping the plea is urged of necessity as guardian of the homestead and companionship in the highways, which is a strange reflection on civilization, inasmuch as it implies safeguarding from the vicious of its own species.

Where a good dog is kept, particularly of the terrier breed, vermin, especially rats, are not troublesome, for the dog either effects capture or gives the owner no peace until the intruder is trapped. But a dog of this description not kept well in hand intrudes into neighbours' back-yards, ashpits and gardens, ever raising “ a bone of contention ” ; and in the highways concerns itself chiefly in hunting hedgebanks for rats and rabbits, and for a long time makes frantic efforts at the mouths of the holes or burrows to “ dig ” out the vermin. This leads to pot-hunting in bye-lanes. The terrier gives place to the lurcher, and the rabbit and hare lead the dog sooner or later into the wood, there as a mark for the keeper's gun, or its putting its leg into a trap, or perchance its head into the “ hugger,” while its owner drifts from fine to imprisonment and ends on gallows.

SELF-HUNTING DOGS are caught by a large and powerful *Hugger Trap* (Wm. Burgess & Co., Malvern Wells), worked with two springs instead of one, and 20-in. jaws, or for general trapping of stray dogs, the Hugger with 10-in. jaws. Sheep-worrying dogs are generally of the large mongrel breeds, and their owners mainly conducive to their onslaught on sheep by allowing them to stray unmuzzled, or even to run where they like by turning them astray at night.

In towns dogs are a great nuisance. The owners turn their dogs into the streets at stated times, or they take them for a run out, and the “ messes ” made against walls, fences, posts, etc., and on pavements and footpaths render many so-called residential parts of towns nauseous to the olfactory organs, unsightly to the eyes, unsafe for the feet, and the odour given to besmeared garments not as savoury as *cau de cologne*. Indeed, the eructations of the dog only differ in degree from those of the cat, notable for its fetor and the powerfully offensive and phosphorous-like odour of its urine.

The female has six to ten mammæ : she goes with young nine weeks as a rule. The pups are born blind, their eyes opening in ten to twelve days ; their first teeth begin to shed at the fourth month ; their growth ceases at two years of age. The ordinary period of life is about ten to twelve years, but dogs not uncommonly live till considerably over this age, and sometimes as long as twenty years.

FERRET (*Mustelo furo*). Cuvier considered the ferret an albino form of the polecat (*M. putoria*). It is a native of Barbary, naturalized in Spain, where it was introduced to rid that country from the multitudes of rabbits. The colour of its whole body is a pale yellow, nose sharp, ears round, and eyes red and fiery. It is lively and active, and an inveterate destroyer of rabbits and rats. If a dead rabbit or rat be presented to a young ferret for the first time he will fly at it with great fury ; but if a young rabbit or rat be presented alive, the ferret will seize it by the throat and suck its blood. The inherent tendency thus passes from parent (Fig. 139) to offspring in a very decisive manner.



FIG. 139.—FERRET AND RAT.

Great numbers of these animals are imported into or bred in this country for the purpose of driving rats from buildings, corn-stacks, etc., also rabbits from their burrows. In such cases the ferrets are muzzled, otherwise they would destroy the rats in their retreats and rabbits in their holes. The rat-catcher has dogs to worry the bolted rats and the warrener places nets over bolt-holes, shoots bolted rabbits, and digs out unbolted, the direction being indicated by a string attached to the ferret. Where ferretting has been practised, both rats and rabbits fight shy of the retreats or burrows thus tainted for some time.

The ferret breeds freely, bringing forth five to nine young ; but

the white ferret is apt to degenerate and lose its savage nature in this country. Warreners, therefore, prefer the English ferret, a cross between the white ferret and polecat; this animal is darker in colour, smaller in size, hardier in constitution, more active in habits, and keener in ferocity. On account of the fierceness in attack of the ferret, great care must be exercised to insure its safe custody.

HEDGEHOG (*Erinaceus europæus*). This well-known animal does not mount fruit trees and descend with apples, pears, etc., stuck upon its bristles, or suck cows and injure their udders; but is undoubtedly an enemy to young game and rabbits, and even to young

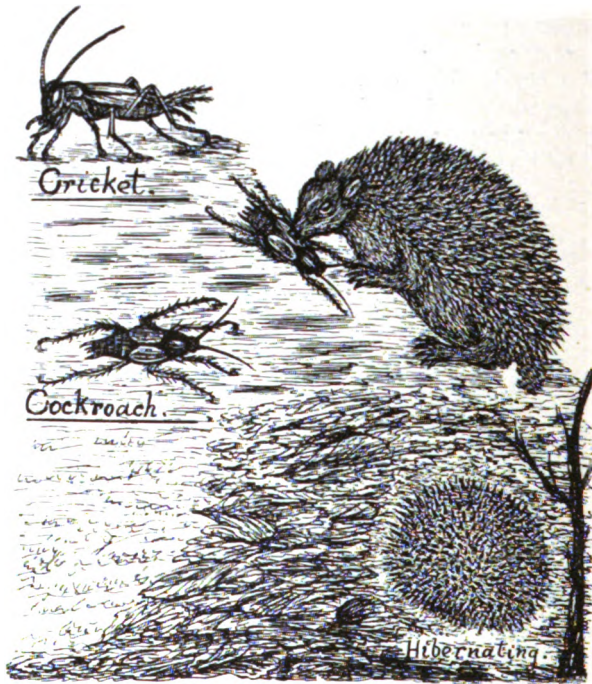


FIG. 140.—HEDGEHOG AT WORK.

poultry. It also feeds largely on ground insects or their larvæ, and has been employed to some extent for destroying cockroaches, etc., in dwellings, bakeries, plant-houses, etc., with more or less satisfactory results.

The hedgehog (Fig. 140) suffers no inconvenience from the croton bug or German cockroach (*Phylodromia germanica*), oriental cockroach (*Periplaneta orientalis*), and house cricket (*Gryllus domesticus*), and Pallas remarks that this animal can eat hundreds of

cantharides without suffering from them, whilst a single one of these acrid insects will cause horrid torments in cats and dogs. It may be kept in any wire-netted garden or pleasure grounds, where no harm appears to result to useful plants or crops, and coleopterous insects certainly are not nearly as much in evidence. Semi-wild places, however, are more to the hedgehog's taste; and if male and female are introduced they increase, four or five young being produced at a birth, and these soon become covered with prickles. The hedgehog wraps itself in a warm nest composed of moss, dried grass and leaves on the approach of winter, and remains torpid till the return of spring. When, therefore, the animal is kept in captivity such material must be provided in a secluded and dry place for its hibernating use.

If kept in close quarters, the hedgehog must be properly fed with flesh—raw or cooked—fallen fruits, roots of plantain, milk-sopped bread, etc. When placed in a building for the destruction of cockroaches, feed sparingly, but always afford it a supply of water in a shallow vessel, introducing the hedgehog in the evening and withdrawing in the morning to a place where not likely to be visited by terriers or other dogs. Cats give hedgehogs a wide berth, but some cats are adepts at capturing and eating house crickets.

CHAPTER XII

BIRDS

THE FALCONIDÆ or Accipitrinæ form one of the two divisions of diurnal birds of prey, and include falcons, hawks and eagles. The falcons proper (genus *Falco*), for strength, symmetry and powers of flight, are the most perfectly developed of the feathered race, and have been employed for affording sport, known as falconry or hawking, in Europe, Asia and Africa from time immemorial. King Alfred wrote on the subject, and the pastime once took precedence of fox-hunting in England, where it was in great favour, having its hereditary grand falconer—the Duke of St. Albans—who, in his office of grand falconer, presents the king with a cast of falcons on the day of his coronation. A similar service was due from the representative of the Stanley family in the Isle of Man. These observances have fallen into desuetude, and the pursuit of hawking in Britain has practically ceased. Attempts have recently been made to revive that sport in this country, but it is hardly consistent with the usages of our times, particularly in the case of highly cultivated land, on account of the general enclosures and from the game being largely followed on foot. Formerly the quarry was usually followed on horseback, but where horses could not follow without difficulty, it was the practice to carry poles. In this connexion Dean Stanley told a good story of King Henry VIII, who, while pursuing his hawk at Hitchin, attempted, with the assistance of his pole, to jump over a wide ditch full of muddy water; but the pole unfortunately breaking, the king “fell head over ears” into the thick mud, where he might have been suffocated had not one of his attendants, seeing the accident, leaped into the ditch after his royal master and pulled him out.

The question of breed in falcons was years ago carefully studied, and the prices paid for good birds were great, a sum of £1,000 being paid for a pair of Iceland hawks, which were regarded as amongst the finest birds for the sport about two hundred years ago. The Iceland falcon (*Falco Islandus*) (Fig. 141), also the Greenland falcon (*F. Greenlandicus* or *candicans*), and the Gyrfalcon proper (*F. gyrfalco*) have been shot in the British Islands. Cranes and herons were considered to furnish the best sport with these large

falcons in former times, and they were used in later times for catching hares and rabbits. The peregrine falcon (*F. peregrinus*), not so



FIG. 141.—THE ICELAND FALCON.

large as the gyrfalcon, but more elegant in shape, and exceedingly swift in flight, said to be 150 miles an hour, was one of those most frequently used in falconry, it naturally preying on grouse, partridges, ptarmigans, pigeons, rabbits, etc. For small game the hobby (*F. subb uto*), (Fig. 142) was a great favourite for the chase when falconry was in fashion, especially by the "ladies."

It is strange how the sport of falconry has dropped into oblivion in this country, as there are still many districts where it might be followed without disadvantage to husbandry, especially as so much arable land has been laid down in recent years to permanent pasture, though possibly this depopulation and depression of food-production process may be restored with advance in the price of breadstuff; and then, as in the time after the seventeenth century up to which falconry continued in favour, firearms supersede it. Attention has lately been drawn to the pursuit of hawking near London, and as a set-off against rabbit-coursing. Mr. B. Morris, of New Park Road, London, has recorded sport in Hertfordshire so recently as seven years ago. "I remember," he states, "the first day I had the privilege and pleasure to be of the party. The

goshawk killed two couple of rabbits. A terrier was used to find the rabbits, and good law being given, the hawk was thrown off the wrist of the falconer, and usually knocked the rabbit over in a few seconds. Once a rabbit took shelter in a thorn-bush, but so great was the speed of the hawk that she dashed into the bush before she could stop herself, and was released with some difficulty. So well trained was this hawk that on the return home she sat on the seat of the phaeton, without being hooded, so far as I can remember" (*The Herts Advertiser and St. Albans Times*).



FIG. 142.—THE HOBBY.

"The training of a hawk is a matter requiring great pains and protracted attention. It is first kept immovable and deprived of light for seventy hours. Its legs are kept bound by jesses, or slender thongs of leather, terminated with bells. It is carefully kept from sleeping, and if it shows signs of resistance its head is plunged in water. It is also deprived of food until, exhausted with want of rest and nourishment, it suffers itself to be hooded. When this first discipline is completed it is unhooded from time to time and offered food, which it seizes with avidity. When it allows itself to be hooded again without resistance it is considered tame. To make it still more dependent, its appetite is stimulated artificially by cleansing out its stomach with balls of tow attached to a thread, which it is made to swallow, and which are afterwards pulled up. This operation produces a raging hunger, by satisfying which the bird is attached to its trainer. These operations have to be frequently repeated. The bird is next taken into a garden and placed on the turf. His hood is lifted, and the falconer presents him with a morsel of meat. If he leaps on the hand of the

trainer to receive it, his education is considered far advanced, and the trainer now endeavours to accustom him to the lure. This is a piece of leather to which the wings and feet of a bird are attached to make it resemble the falcon's prey. To this a piece of meat is attached. The use is to recall the bird when it is allowed to fly into the air. The lure, in order to make the bird thoroughly accustomed to it, is made the means of conveying to it all its food. The bird is also taught to obey the voice of the falconer, without which precaution even the lure would be insufficient. When it has been taught to obey the lure in a garden it is carried to the open field, and being attached to a cord 60 or 70 ft. long, it is uncovered and shown the lure at a little distance. If it flies to it it is fed. The next day it is tried at a greater distance, and when it flies to the lure at the full distance of the cord it is considered fully tried. It is then practically in the mode of seizing its game, which is done with tame game attached to a peg. It is then made to fly at free game whose eyes have been bound, and when it is fully trained it is used for sport. It is always kept hooded during excursions, until it is wanted to fly " (*The Popular Encyclopedia*, half-vol. V., p. 301).

COMMON GULL (*Larus canus*). The gull has a voracious appetite, and is easily tamed. For keeping in captivity it must be procured young, have one wing pinioned, or the feathers of one wing shortened. Pinioning signifies captivity, or flight lost for life; clipping implies temporary or for the time ineffective means for flying, for when the feathers are allowed to grow, the captive may return to the seacoast, where both wings intact are essential for ensuring safety and procuring needful food.

The gull may be kept either solitary or in company. When two gulls are together the weaker generally becomes the victim of the ill-nature of the stronger, and in feeding they display naturally quarrelsome and voracious habits; hence in supplying food this must be so placed that each bird may receive a fair share. The refuse of the scullery—fragments of raw or cooked meat, fish and vegetable substances—should be given at least once a day, preferably in the morning, a vessel being at hand for holding water and replenished as required.

In spring, summer and autumn the gull does well on a lawn, but during winter it must be accorded the shelter of an outhouse in severe weather, supplying food regularly twice a day. If any mice come within sight and reach, they quickly disappear down the gull's throat; it being a "sight" to watch a gull appropriate mice caught in traps, whether dead or alive, as each mouse passes out of sight head foremost.

We have kept gulls on lawns and in pleasure grounds for many years, food and water being supplied beneath or near a sheltering low tree, such as a standard thorn, and without injury to either

grass or plants, the enclosure being kept singularly free from ground pests. In such places gulls are useful and to such they must be confined, for when they have run of vegetable quarters they not only devour small mammals, molluscs (slugs), crustaceans (woodlice), myriapods (millipedes), annelids (worms), and insects—their grubs or larvæ, but tear young cabbages, lettuces, etc., into shreds and tatters, being only surpassed in this respect by poultry (with which the gull associates in the farmyard and duck-pond); these, without exception of breed, destroying ground insects most effectually and inflicting most injury on cultivated crops.

LAPWING or PEEWIT (*Vanellus cristatus*). This exceedingly lively and nimble well-known bird, all its movements suggesting possession of great instinctive powers, takes to confinement without demur, provided it be captured just before being capable of flight, and thrives either in a walled, boarded or wire-fenced garden, living

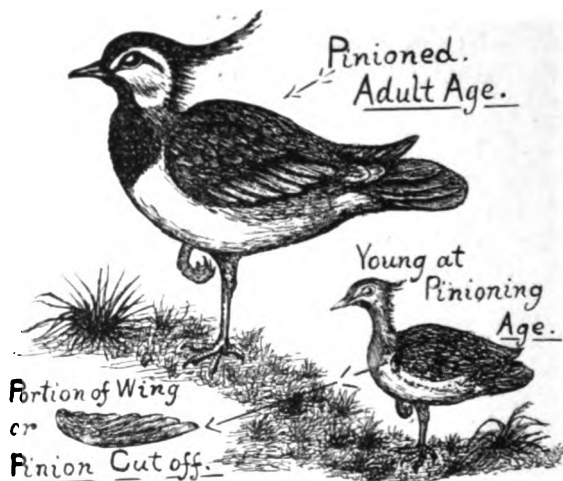


FIG. 143.—LAPWING PINIONED.

entirely upon insect food. One wing must be pinioned (Fig. 143) or have the feathers shortened, the latter being most humane, but requires to be repeated from time to time.

The captive peewit requires a supply of water in a shallow vessel during dry weather, and in severe winters or during frost and snow visits the outsides of fruit or plant houses, when the bird must be admitted to the interiors, where it will subsist for weeks on food derived from the soil of beds and borders. Cool structures, such as greenhouses or winter gardens, or houses in which bedding plants are wintered, the area beneath the stages being soil, prove most satisfactory. Where the floor is a hard one or there is likely

to be a scarcity of worms, pieces of fresh, raw, lean beef cut into small strips resembling earthworms, should be daily provided for the captive, with a supply of water in a saucer.

In the way described we have kept peewits several years in a walled kitchen-garden, the birds (not more than two per acre area) regularly coming to the door of a large greenhouse with earth-bed and border on the setting-in of severe weather, entering the structure readily on opening the door, and abiding contentedly during the "hard" frost and snow period. On the approach of a general thaw the peewits waited near the door and came out of their own accord in due time, giving no trouble during the many years of their captivity and life, but the replenishing of saucers in an angle of the garden with water during dry weather.

Peewits are great ornaments in pleasure grounds, especially in damp places near water, and they do well, provided that on the approach of severe weather they are transferred to a cool greenhouse, winter garden, or fernery, till the return of mild weather.

CHAPTER XIII

POULTRY

THIS is a general name for all birds bred for the table, or kept for their eggs. The birds most commonly included under this designation are the fowl in the restricted sense of the term, the peafowl, the guinea-fowl, the turkey, goose and duck.

PIGEON.—The domestic or house pigeons have sprung from the Rock Dove or Rock Pigeon (*Columba livia*). It builds in the holes and crevices of rocks, its food consisting of grains. It is, however, also said to feed on snails, etc. The house pigeons, tumblers, fantails, carriers and jacobins are the chief varieties of the Rock Pigeon, and are well known as forming some of the most elegant of domesticated birds, and were employed by Darwin in his *Origin of Species* and his *Animals under Domestication* to illustrate many points involved in his theory of "descent by natural selection." The Blue Rock Pigeon is that generally kept for profit and marketing in farmer's dovecotes. This practice dates from the fifth Egyptian dynasty, about 3,000 B.C. In the time of the Romans, according to Pliny, immense prices were given for pigeons, "nay, they are come to this pass, that they can reckon up their pedigree and race." About the year 1600, pigeons were so valued by Akber Khan in India, that never less than 20,000 pigeons were taken with the court. "The monarchs of Iran and Turan sent him some very rare birds, and," continues the courtly historian, "His Majesty by crossing the breeds, which method was never practised before, has improved them astonishingly." The Dutch, about this same period, were as eager about pigeons as were the old Romans.

At the present time pigeons are less kept for profit than in former times, particularly by farmers, but the rage for the Carrier Pigeon has attained to little short of a *mania*. The Common Carrier Pigeon is a large bird with long wings, large tuberculated cere, and with a circle of naked red skin round the eyes. The practice of sending letters by pigeons belongs principally to eastern countries. The first pigeon used as a messenger some consider to be that which Noah sent from the ark, and which returned with the leaf of the olive. In the province of Irak (that is Chaldæa, Babylonia and Assyria), white pigeons are trained with least difficulty.

An actual post system, in which pigeons were the messengers, was established by the Sultan Nouredin Mahmood, who died in 1174. It was improved and extended by the Caliph Ahmed Alraser Lidiv-Allah, of Bagdad, who died in 1225. This flying post lasted till 1258, when Bagdad fell into the hands of the Mongols, and was destroyed by them. There were similar posts in Egypt in 1450. The use of pigeons as messengers, however, was not confined to the nations of the East. Decius Brutus, according to the Elder Pliny's account, sent despatches from Modena by pigeons, and in modern times they were made use of during the Dutch war by the inhabitants of Haarlem when besieged in 1573, and at Leyden in 1574, and by the besieged residents in Paris during the Franco-Prussian war of 1870-1.

The Carrier Pigeon is now used extensively by fanciers for what may be termed *sporting* purposes, the object being to attain the most striking development of the "homing" faculty, and accomplishing of the longest distances with greatest speed. The "fancy" varieties are named from their particular characteristics: the pouters from their inflated crops; the fantails from their expanded tail, consisting of no less than thirty-six feathers, the jacobins from the presence of a ruff or hood of feathers on the neck and head, and the tumblers from their habit of tumbling over in the air whilst flying.

The domestic pigeons are noted for their "love of home," and when regularly and abundantly fed they are not liable to fly abroad for sustenance, and this entirely prevents those frequent losses, from straying and by robbery, to which those who allow their pigeons to pilfer their neighbour's produce are so constantly subject. Pigeons, as a rule, do no harm in gardens, and in cornfields, though under pressing circumstances of hunger they will visit newly sown corn and pluck it up, also corn in sheaf, and even feed on tops of brassicas. The worst part of this plundering is that of the "pigeon clubs" being able to penalize those taking repressive measures against the depredating pigeons, and the owners of these not responsible for negligence in feeding and in keeping them at home.

COCK (*Phasianus gallus*). The cock is the well-known chieftain of the poultry-yard, and rural announcer of the passage of time, whose shrill clarion, heard in the still watches of the night, inspires the restless and invalid with cheering hopes of the coming dawn, and informs the wayworn traveller of his approach to human habitation, where domesticated, but not subdued, he marches at the head of his train of wives and offspring with a port of proud defiance, not less ready to punish aggression against his dependents than to assert his superiority upon the challenge of any rival. At what time this valuable species of pheasant was brought under the immediate control of man it is now impossible to determine;

but as the forests of many parts of India still abound with several varieties of the cock in the wild or natural condition, it is quite reasonable to conclude that the race was first domesticated in the eastern countries, and gradually extended thence to the rest of the world. The cock is always more splendid in plumage than the hen, and when in good health and full plumage his movements and gestures seem all influenced by consciousness of personal beauty and courage : his stately march and frequent triumphant crowing express confidence in his strength and bravery. His sexual powers are matured when he is about six months old, and his full vigour lasts for about three years.

The hen is ready to commence laying after she has moulted or changed her plumage, and is not at the trouble of making a regular nest. A simple hole scratched in the ground in some retired place serves her purpose, and she generally lays from twelve to fifteen eggs before she begins to sit upon them for the purpose of hatching. In sitting she becomes a model of enduring patience, remaining fixed in her place until the urgency of hunger forces her to go in quest of food : then a short time suffices for running eagerly about in quest of sustenance, and soon resumes her charge. In twenty-one days the incubation is completed, and when the whole of the young birds are hatched out she leads them forth in search of food. With her brood her natural timidity departs, for she fiercely and vigorously attacks all aggressors, watches over the safety of her young with the utmost jealousy, neglects the demands of her own appetite to divide the food she may obtain among her nurslings, and labours with untiring diligence to provide them sufficient sustenance.

Fowl (Anglo-Saxon, *fugel*, a bird, connected with the verb to fly) is a term now used to designate the genus *Gallus*, of which the common barn-door fowl is a familiar example. There are several examples of the genus *Gallus*, such as the *Jungle Fowl*, a native of India, which is rather less than the domestic fowl. The *Bankiva Jungle Fowl*, now supposed to be the original stock of the domesticated poultry, is a native of Java, the male closely resembling the English gamecock. The *Cochin-China Fowl* is a large, ungainly bird, chiefly valuable for its fecundity, eggs being laid during winter. The *Game Fowl* is noted for its pugnacity, bright plumage, and excellent flesh. The *Dorkings* are short-legged, round-bodied, plump, and excellent for table. The *Spanish* is a very fine variety, glossy black, excellent in flesh, and the hens regular layers. The *Bantam*, a puny little member of the tribe, mostly kept for fancy, and for sitting partridge eggs. The common Barn-door Fowl is a compound of various breeds, therefore of no particular one, no pains being taken to prevent crossing. Of the various breeds the most in request for hatching pheasant eggs are the lighter-weight hens of the *Barn-door Fowl* and the *Silver Wyandotte Fowl*, as they

are quiet, excellent mothers, clean legged, not too heavy, and also first-rate layers.

The food of the fowl consists of grain and other hand-prepared substances supplied betimes by the owner; and when given run of farmstead and environs, or grassy places with plantations of sheltering trees, the fowl feeds upon the young shoots of plants, insects of all kinds, woodlice, millepedes, slugs, worms, etc., berries, grass seeds, etc. The way the fowl shows its fondness for insect food by scratching is remarkable, and the number of wireworms and grubs unearthed and devoured is astonishing. Of course fowls

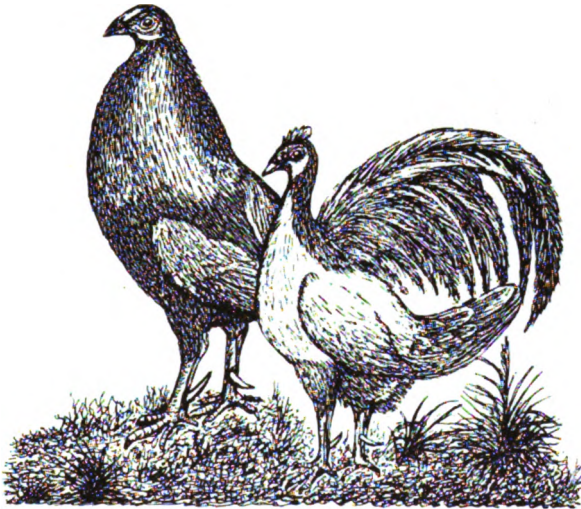


FIG. 144.—THE OLD ENGLISH GAME.

must be kept out of gardens by proper netting protection, then, given free run of the homestead's adjacent ground, and not in danger of trespassing on another person's enclosure, they profit by destroying pests and by enriching the soil.

The utility of brood-hens and their chickens in grass orchards is noteworthy, for they do an immense amount of beneficent work by destroying insects and manuring the ground. Likewise on any grass land not physically unfit, poultry-rearing thereon "tells a tale," both as regards clearance of insects and aftergrowth of herbage. Even in pleasure grounds a "clucking" hen in a coop here and there with her chickens at liberty in daytime does much good, provided the coop and hen be shifted betimes and the family cleared away in due course.

In fruit plantations hens with broods of chickens cooped on

grassy roadways are useful, and free adults somewhat helpful in destroying ground pests and for disposing of aerial ones dislodged by wind or shaken down by the grower. Where low bush fruits, however, are grown, fowls help themselves to berries, of which they are little less fond than of insects, and must therefore be withdrawn before the "poults" are of such size as to be capable of mischief. In gardens and vegetable grounds domestic fowls are out of place, as they always scratch in the wrong place, consume almost every kind of crop, and delight, even as chickens, in such plants as young onions, succulent lettuces, etc.

GUINEA-FOWL (*Numida Meleagris*), Fig. 145. The guinea-fowl belongs to the pheasant family or Phasianidæ. Its name is due to the circumstance that birds of this genus are common in Guinea,

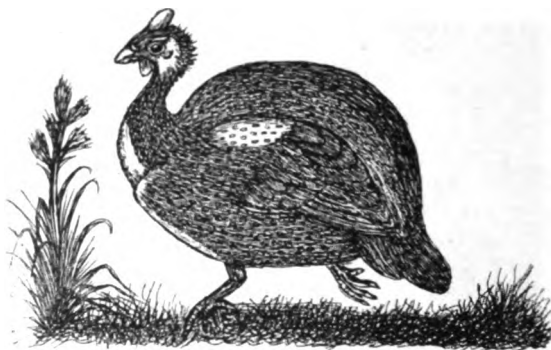


FIG. 145.—THE COMMON GUINEA-FOWL.

and its generic name is derived from the fact that the Romans called this bird the Numidian fowl. The Greeks applied the name *Meleagris* to this bird, not to the turkey, as Ray, Aldovrandi, and others erroneously supposed; therefore has been selected as the specific name of the common guinea-fowl.

The common guinea-fowl has a slate-coloured plumage covered with round white spots, which the Greeks fabled to be the tears shed on the death of Meleager by his sisters, who were changed by Artemis into guinea-fowls. It is about the size of a cock, noisy and quarrelsome in disposition, hence disagreeable in the neighbourhood of dwellings. In large parks, however, where it can run about in freedom, it is by no means an unpleasant bird. Its flesh is succulent, and esteemed as food. About the end of May the female lays in hedges and brushwood from fifteen to twenty eggs of a uniform dull-reddish hue, rather smaller than those of the common hen, and good to eat. Incubation lasts twenty-five days, but the guinea-fowl is a bad sitter; therefore its eggs are

usually given to barn-door hens to hatch. The food of the guinea-fowl consists of grain and other substances usually given to ordinary fowls, much natural or cultivated herbage, and largely subsists upon ground insects and their larvæ, in quest of which it roams over much larger areas than domestic fowls.

In large parks, farm and other homesteads surrounded by park-like grassland with the usual accompaniment of trees in clump and



FIG. 146.—THE PEACOCK.

belt, guinea-fowls may be tolerated. But in pleasure grounds and flower gardens they scratch where they ought not and peck into shreds the plants most fancied and desired to be kept intact, while in kitchen gardens they ruin the crops.

PEACOCK (*Pavo cristatus*). The peacock belongs to the sub-family Pavoninæ of the pheasant family Phasianidæ, and India appears to be its natural habitat, but it is abundantly domesticated in Europe. The male is the bird of "fine feathers," the female, more sombre, presenting a striking contrast to the brilliant

appearance of her mate. In a tame state these birds begin to breed at the end of March or beginning of April. The eggs are laid in a gradual manner, one egg being deposited every two days, and the entire number reaching ten or twelve. The eggs are large, resembling goose eggs in size, white with darker spots. Incubation lasts from twenty-five to thirty days. The young birds are feathered alike for the first two years, and in the third year the tail coverts of the male begin to be developed and to assume their lustrous appearance, when also the males begin to parade their attractions before the eyes of their mates. The third year is the first in which the young peahen produces eggs.

Alexander the Great first brought the peacock into Europe, and they were first seen in Rome at the end of the republic. Hor-tensius, according to Pliny, was the first who made a table delicacy of the peacock, this worthy orator presenting the dish at a feast given to the College of Augurs. Vitellius and Heliogabalus introduced dishes at their feasts composed of the brains and tongues of peacocks, and in the Middle Ages in Europe peacocks were still deemed meet dishes for the tables of the great. In modern times the flesh of peacocks is accounted coarse and tough.

The food consists of grain of various kinds, but in certain cases the peacock will feed on a very miscellaneous diet. In large pleasure grounds a few pea-fowls appear to great advantage, there being little that requires cultivation, and when duly supplied with grain or other food. But in vegetable grounds they are very destructive, clearing out whole rows of recently sown peas, etc., with great gusto, and thief-like are extremely crafty in selecting times for committing their depredations. They destroy various ground pests.

TURKEY (*Meleagris gallopavo*). The turkey appears to have come originally from America, and is now a well-known denizen of our farmyards. Where given plenty of grass-run turkeys are not so given to invade gardens as fowls, though when they do the havoc they commit is appalling. In a grass orchard a brood of young turkeys are valuable in destroying ground pests, also aerial, that come within reach, and no harm is done provided the mother be shifted betimes, and not left in one place till the grass be ruined : besides, it is necessary that the coop be moved a short distance every day for the health of the young turkeys, and also that they may "till" and clear of pests the area adequate to their requirements without inflicting damage. In many rearing-places the coops, particularly on poultry-rearing grounds, are so closely disposed and so infrequently moved, that the grass is practically destroyed in places, and the whole left so patchy and uneven and withal so foul that only breaking up and relaying is feasible. To "sweeten" the ground after fowl-rearing a dressing of lime is usually applied, with the result of a great evolution of ammonia

and a very luxuriant growth of grass that, like "fatweed, rots itself." A better result is had from a dressing of basic slag, 1 ton per acre, 14 lb. per rod (30½ square yards), and, on light land, immediately followed with 5 cwt. of kainit per acre, 3½ lb. per rod.

GOOSE (*Anser ferus*). The common or Gray-leg goose, at one time common enough in the fenny districts of England, remaining there all the year round, is now rare in this country, but its domes-

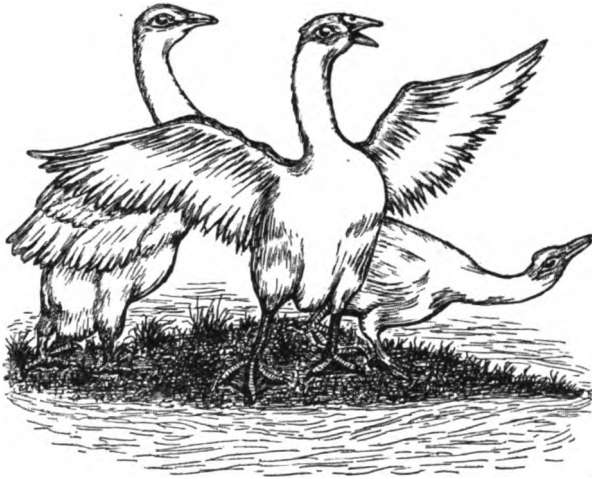


FIG. 147.—THE COMMON GOOSE. MALE AND FEMALE.

tication has induced numerous varieties, and greatly added to the fecundity of the bird. When the wild goose was domesticated is uncertain, but the liver of a fat goose, which is often larger than all the other viscera, was a dish in so great reputation among the epicures of Rome that Pliny thought it deserved a serious discussion as to whom the honour of inventing so excellent a dish was due. They fed their geese on figs to improve their relish, and were not ignorant that they fattened sooner in a dark room. The celebrated *pâtés de foie gras* of Strasburg are made of goose livers, which are brought to a state of abnormal enlargement by keeping the birds in an apartment with a high temperature.

Everybody knows that Lincolnshire is famous for its breeding of geese, that goose-down and feathers are in great esteem for cushions, beds, etc., and the flesh highly prized.

Geese are great feeders on grass and fond of water, from which they derive some subsistence in the form of water-herbage and various larval and adult insecta, crustacea, mollusca, etc. The chief food, however, beyond that supplied as grain and other vegetable substances, is herbage, and unless there be a good run

of grassland, such as that of a village green or common, geese are out of place. The small breeds, such as the Spanish, are, however, sometimes kept on ornamental ponds and lakes, and when these are surrounded by extensive grazing areas, the geese, if not too many, say a male and two females per quarter-acre surface of water, are useful in keeping down water-plants, and the land for some distance around the water short in herbage and free from slugs, etc. Nevertheless, they muddle the water, foul the land precincts, and generally spoil both in appearance.

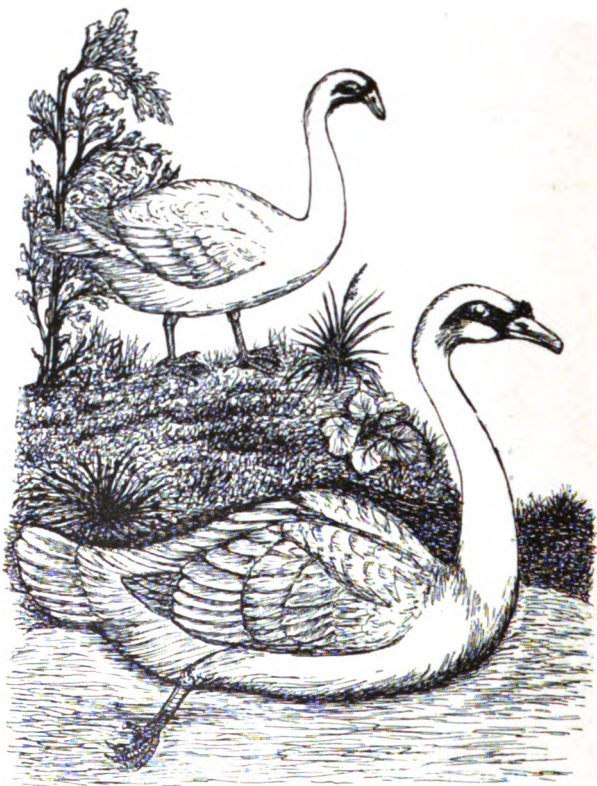


FIG. 148.—THE COMMON MUTE OR TAME SWAN.

SWAN (*Cygnus* sp.). The common mute or tame swan (*Cygnus olor*) is the only species which is permanently resident in Britain. The nest is constructed of reeds and grasses, and is generally situated near the edge of the water in some islet. The eggs are large and of a greenish-white colour, and number six or seven,

The young, called "cygnets," when hatched and for some time afterwards, are of a light bluish-grey colour. The parents are very jealous of their nest and young, the male being mostly at hand during sitting, and fierce in repelling intruders. The food consists of vegetable matters chiefly, but it also includes various water mollusca, crustacea, annelids, insect larvæ, and the smaller fishes; and there is no doubt that fish spawn forms a dainty morsel of these birds, also of geese and ducks, which thus destroy large quantities of valuable material.

The swan, admitted emperor of majestic appearance and bearing on water, has been protected from a very early date by both legal and regal interference, they being declared to be exclusively "royal" or king's property, and no subject allowed to hold possession of these birds save under special favour from the sovereign, the ownership being denoted by a "swan" mark, that of the crown, and of the Dyers' and Vintners' Companies taking place on the first Monday in August, the mark being cut in the bill. The crown mark consists of five diamonds, that of the University of Oxford an arrangement of crosses, Cambridge of three buckles, whilst the Vintners' Company mark these birds with a double chevron. In Henry VII's reign the theft of a swan's egg was deemed an offence punishable by a year's imprisonment, and the theft of a swan itself was very severely punished.

CYGNETS, or young swans, are still regarded as a royal dish, they being prepared for King Edward VII's table by his swan keeper at Hampton Court, thirty-six of the cygnets in the Thames being fattened in each year for use at His Majesty's table at Christmas, cygnets having been a royal delicacy for many years past. The birds are selected from those hatched in the Thames during the year: the swans on the river being owned by the King and the Vintners' and Dyers' Companies, and are kept several weeks in a wired-in enclosure on the Thames, where they receive special diet to fit them for table use. Of course, all the cygnets are not consumed at the King's table, some of them being sent as presents by King Edward to other royalties and personal friends of His Majesty.

No greater ornament exists on a lake or river than the swan, and in utility it is to deep water in destroying bottom growth of weeds what the duck effects so well in shallow water by keeping the surface free from duckweed, etc. The swan, including the black swan (*Cygnus atratus*), an Australian species first discovered in 1698, is kept in many ornamental waters; but it is not advisable to introduce swans to water planted with water-lilies (*Nymphæas*), as they are apt to pull the plants to pieces, or to plant water-lilies in lakes inhabited by swans.

BEWICK'S SWAN (*Cygnus minor* or *Bewicki*) passes the winter in Britain and flies northwards in spring. Its length is about 4 ft.

It possesses an orange patch at the base of the bill, and is able to produce a very grating noise. This cry resembles the word "hoop," and is produced through the peculiar arrangement of the trachea or windpipe, and is also a characteristic of the Hooper or Whistling Swan (*C. ferus*), which has a slender beak, black at its tip and yellow at the base, whilst it wants the black knot or tubercle on the beak. This bird arrives in Britain in winter and departs in April.

DUCK (*Anas sp.*). The ducks proper are distinguished from the swans by having shorter necks; and from the geese by having shorter necks, and legs less strong and placed further back. They also subsist largely on insects and other animal food, while geese and swans live mostly on vegetable food.

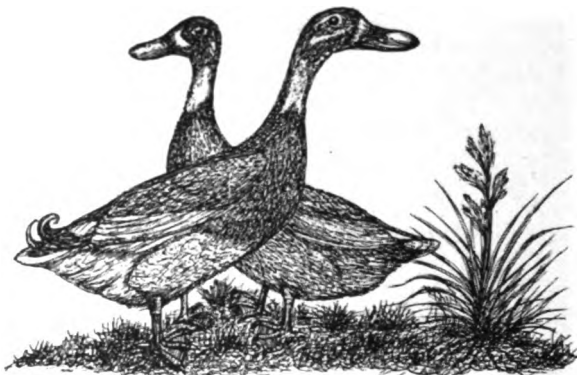


FIG. 149.—THE INDIAN RUNNER DUCK.

The MALLARD or COMMON WILD DUCK (*A. boschas*) is the original stock of the domesticated duck, which appears to have been reclaimed at a very early period, and is now sometimes utilized for effecting a cross between the domestic duck in order to produce a smaller, more fleshy and less fat bird for table, the male domestic duck, usually Rouen, consorting with the female wild duck, and after once crossing, the progeny are as much at home on the farm-pond as the tame birds.

Ducks of various small breeds, such as the *black* (East India) and Indian Runner, both excellent *foragers*, are often kept on ornamental waters, and render good service in keeping down weeds and confervaceous growths in the water, and in scouring the adjoining ground and freeing it from slugs and allied pests. This applies to all the species and varieties of duck kept mainly for ornament in moderate number on ponds and lakes. Too many ducks in proportion to the area of water and forage ground spoil both, the

water being made muddy and foul, and the grass also in the immediate vicinity unsightly and unpleasant. The apportionment of the drakes to the ducks deserves attention. On a quarter-acre of cemented pond one drake and two ducks proved disastrous to the latter. The drakes, therefore, as a rule, ought not to be reserved in greater proportion than one to every five ducks. The ducks must be fed every morning with small maize, buckwheat, etc., strewing major part in shallow water.

DOMESTIC DUCKS, *Aylesbury*, *Rouen*, etc., are always praised by poultry-keepers for shovelling up slugs, and they advocate admission of ducklings into gardens and vegetable grounds. This is a very questionable utility procedure where the crops are young and likely to be trodden down and broken, and in the case of ducklings over a month old, almost certain to do more harm than good. On the other hand, where the crops are advanced in growth and not likely to be injured by webbed feet under heavy bodies, ducklings of under a month old, or even older are useful for destroying slugs in gardens and vegetable grounds. The ducklings should be turned into the plot infested with slugs early in the morning or during moist weather, always on an empty stomach, and the ducks cleared off the ground as soon as they have done foraging. The question of the usefulness or otherwise of ducklings to cultivators of crops thus resolves itself into a matter for discriminative judgment.

CHAPTER XIV

REPTILES

COMMON FROG (*Rana temporaria*). Our experience of this familiar animal in a state of confinement is restricted to a fernery under glass, where a three-legged one, with others, thrived for several years, the one with a leg cut off by a scythe in mowing meadow grass, and named "Lord Raglan"—it was the time of the Crimean War—being docile, making quick work of worms, slugs, woodlice, etc., presented to it, and always in summer time taking up a position beneath a water-tap, which was so left that now and again water dropped on the frog's back, the animal so placing itself that the water fell just behind the eyes and trickled over the whole body.

In gardens we have found frogs useful in destroying worms, slugs, woodlice, insects and their larvæ; but frogs are more suited to the semi-wild and wilderness side of nature rather than that of cultivation, though this certainly profits by the decimation of pests by frogs in rough places by ditches, etc.; especially gnats.

COMMON TOAD (*Bufo vulgaris*). The forester, farmer and gardener has no better friend towards his crops than the despised toad, for rambling at night in woodland, in field and in garden, it destroys numbers of woodlice, millipedes, slugs, grubs and insects which hide by day and come out at night to feed upon vegetation. The toad also hides by day, and at dusk, or on dull days before rain, sallies forth with cautious steps: and dull, slow, heavy and ungainly as it may appear, ranges over the ground snapping up pests then come forth to banquet. In sight of prey the toad's look becomes intent, its action hasty but cautious, and when within striking distance the body is raised on the hinder feet, aim taken for a moment, and then the prey seems to suddenly spring into the toad's mouth. It prefers woodlice as food, but feeds on slugs, beetles and weevils, flies and moths, grubs and caterpillars, earth-worms, etc.

In most pleasure grounds and flower gardens toads find suitable retreats for hiding by day and for hibernating in winter, such as a hedge, neglected nook, rockery for ferns, or rockery for rock plants. A toad-house, however, may need to be formed in some cases where it is desired to introduce toads, and is readily formed of stones, burrs, or butts of trees placed in an unobjectionable situation. The material may be arranged on a bank or on a slight

mound so as to make tortuous burrow-like cavities, open externally and closed at about 18 in. from the entrances. On the material so disposed place about 18 in. depth of earth and plant periwinkle on the mound. This domicile will be more ornamental than otherwise, and answers admirably in a somewhat shaded and secluded situation.

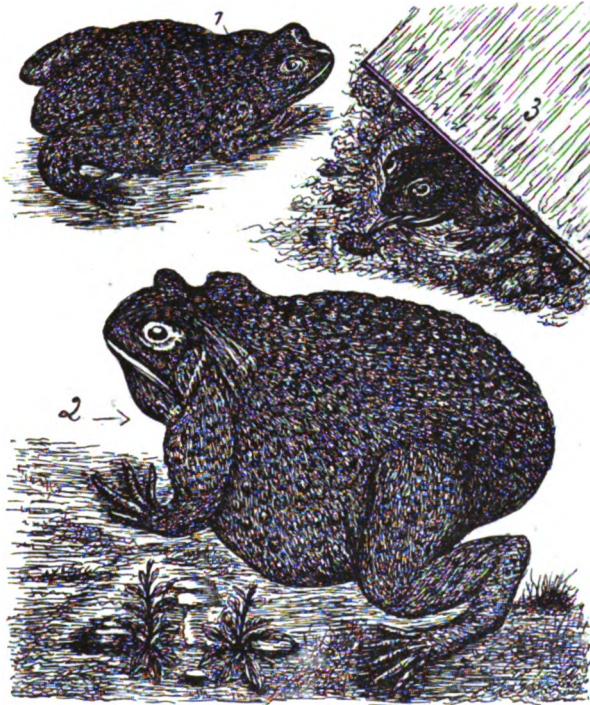


FIG. 150.—COMMON TOAD.

1. When introduced to glass structure. 2. After high feeding on pests. 3. Shelter.

We have kept toads in cold and heated frames and pits, green-houses and hothouses, mushroom houses, etc., and found them invaluable in clearing woodlice in cucumber and melon frames, pits and houses, tomato and fruit structures, pineapple and plant stoves, greenhouses, orchid houses, ferneries and mushroom sheds. The animals are quite harmless and inoffensive, not poisonous, yet secreting an acid liquid from the large tubercles, so that dogs do not care to bite them. The appearance of the creature may not be pleasant, but the eyes are beautiful : and though a person

cannot muster sufficient courage to handle one, he may, at all events, extend care and protection to an extremely useful animal, placing when one is seen in jeopardy in a place of safety by taking in a shovel.

If any person possesses a frame, greenhouse, etc., no animal exists better capable of rendering service in the destruction of woodlice than the ugly, sprawling, awkward toad, and we ask that it be given a chance to display its merits, placing at least one in every frame, pit, or house. If lean and frog-like (Fig. 150, 1), when placed in the structure, it will soon broaden out, sometimes attaining a large size (2), fine specimen, reaching nearly 1 lb. in weight. Where there is some soft earth the toad soon digs a hiding-place, working backwards and pushing out the loose earth in front, thus wriggling itself into the ground and keeping its head towards the entrance of the hole. A few clods of earth and a slate placed over them in the corner of a frame, pit, bed or house (3) will soon be taken possession of by woodlice and an introduced toad. Where no soil or soft material exists for the animal to hide in, two bricks may be set on edge about 3 in. apart against a wall, covering with a tile or slate. If in a corner and about three-parts filled with cocoa refuse, spent tan or loose earth, the toad will speedily take possession of the "house" and keep therefrom a watchful eye on woodlice. Some loose material should be placed against the bricks and on the slate, but not entirely closing the opening.

The toad hibernates a shorter time during the winter in green-houses, stoves, etc., than outdoors, retiring, as a rule, early in autumn stout and sleek. After a few weeks' repose it comes forth relatively lean and eager for feeding on woodlice. In return for services rendered at no cost, only perhaps a small outlay for possession, the toad requires care, not injuring it in moving soil, etc., with spade, fork, or shovel, and not treading upon it in looking round the houses at night for ascertaining temperatures, and when, in case of raised beds or pits, the animal be found fallen on pathways, lifting it up to the proper quarters.

NEWT. The newts (*Triton taniatus*) and great water-newt (*T. cristatus*) are sometimes placed in water-lily tubs, and kept there by means of a zinc rim two inches wide all round top of tub, so as to project one inch over the water, the water being kept two inches lower than the rim. A few large pieces of cork bark are also fixed to float, forming a small island on which is set a fern in moss and a little soil, securing the cork with copper wire, so it cannot float to side. This island is for newts and tritons to get on and attract flies, etc., which they catch and eat. The "island" is imperative for the newts to get on, for they won't live if always under water.

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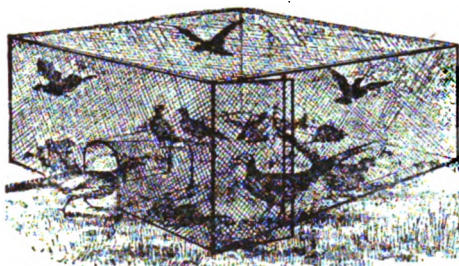
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